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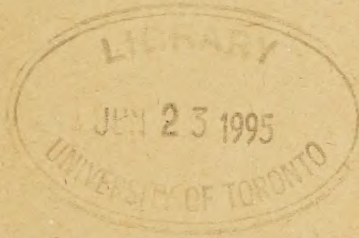
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CANADA

NATURAL RESOURCES CANADA, VOL. 9.

Department of the Interior, Ottawa.

(1930). July - Dec.





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NATURAL RESOURCES CANADA

Published by DEPARTMENT OF THE INTERIOR, Ottawa

VOL. 9

JULY, 1930

TO HOLD ALPINE CLUB'S 1930 CAMP IN JASPER PARK

ALPINISTS CHOOSE MALIGNE LAKE AREA

Outstanding Beauty Spot of Rockies Offers Splendid Opportunities for Mountain Climbing

The Alpine Club of Canada has chosen the wonderful Maligne Lake district of Jasper national park in Alberta as the site for the headquarters of this year's annual camp. The members of the club will foregather on July 28, and from the opening day until the tents are struck on August 16, ascents of a number of peaks will be made in this region, which, owing to its widely diversified topographical characteristics, is of exceptional interest to mountaineers.

The location of this summer's camp is a particularly happy one from an alpinist's point of view. It will afford opportunities for climbing of various degrees of difficulty, both rock and ice work and also for exploration and first ascents, while for scenic beauty the region can scarcely be surpassed in the Rockies.

The main camp will be pitched close to the mouth of Coronet creek at the south end of Maligne lake and will have an altitude approximately 5,500 feet above sea level. Directly behind the site of the camp, in close proximity, tower the buttressed walls of mount Warren; to the left the twin peaks of mount Mary Vaux and mount Llysfran, the latter a needle of rock and the former capped with virgin snow, with deep, flower-dotted valleys dividing them. To the south and west rise several unnamed and unclimbed peaks. On the east mount Leah and mount Sampson, impressive rock massifs, lift their towering heads of bare rock, while directly opposite them mounts Charlton and Unwin, heavily draped with snow and ice, overshadow with their great height all the other surrounding peaks.

Few ascents have been made in the Maligne Lake district and part of the region remains still unmapped and unexplored. In the summer of 1923, Mr. Howard Palmer, then Vice-President of the American Alpine Club, and Mr. Alan Carpe spent several weeks in this area in which they carried out valuable exploration work and climbed Replica peak, 9,150 feet, mount Henry Macleod, 10,600 feet; mount Brazeau, 11,250 feet; mount Unwin, 10,550 feet. These climbs were all first ascents. In 1928 a party headed by Dr. J. Monroe

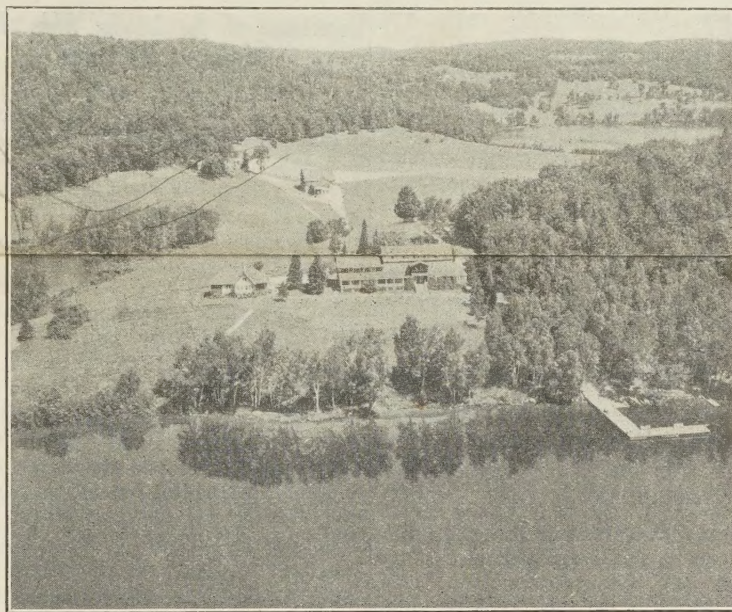
(Continued on page 2)

FLYING OPERATIONS IN CANADA

Program of Aerial Work for 1930 Season Outlined—Air Force and Department of the Interior Co-operate

With the commencement of the summer aerial photographic season an extensive program of aerial photography and exploration is being undertaken by the Royal Canadian Air Force in co-operation with the Department of the Interior. In so far as this Department is concerned, the activities of the Air Force come under two general heads,

ment will operate in British Columbia; one will be in Alberta; four in Manitoba, Saskatchewan, the Northwest Territories, and Western Ontario; four in Ontario and Quebec; and one in the Maritime Provinces. In addition a detachment will be assigned to special transportation work such as carrying surveyors, explorers, and other officials



Flying Operations in Canada—Aerial photographs are put to many uses in the development of the Dominion's natural resources. Pictures like the above view of a tourist resort in the Muskoka Lakes district of Ontario are of great value in making known our scenic and recreational areas, both at home and abroad.

Aerial Surveys and Aerial Patrols of Forests. During the winter months these operations are more or less at a standstill although two aeroplanes operated over the Porcupine and Pasquia forest reserves for the greater part of the winter. This work was largely of an experimental nature and other experimental and test flights were taken from the Ottawa base.

The Surveys Bureau of the Department of the Interior acts as a clearing house for aerial surveys for all purposes, including photography, reconnaissance, and investigations. The various demands for aerial surveys for any district are co-ordinated by the Director General of Surveys and the results of the experimental work carried on are used in subsequent operations. Considerable development of this new science took place in 1929, the benefits of which are applicable to the larger work of this year.

Eleven detachments of two planes each will be engaged on photographic work this season. Of these one detach-

into inaccessible regions, and another detachment to the exploration and photography of the main aerial routes in the Far North. The work on which this latter detachment will be engaged is one of far-reaching importance. The experience of the last few years has shown beyond a doubt that at least for many years aerial transportation will be almost the sole means of communication throughout these vast and little-known areas. The exploration of safe-flying routes is, therefore, one of the first considerations towards opening up this country.

In the mapping field, the operations call for aerial photography in the Bridgewater and Lunenburg areas in Nova Scotia; in an area near Newcastle in New Brunswick; in areas in Quebec in the Lake St. John and the Upper Gatineau districts; in Ontario, in the vicinity of Algonquin park and North Bay, also Port Arthur and the vicinity of lake Nipigon; in Manitoba, in the vicinity of Fort Churchill, and also in the vicinity of Granville lake;

(Continued on page 3)

CANADA'S LEADING PART AT WORLD POWER CONFERENCE

DOMINION'S DELEGATION A REPRESENTATIVE ONE

Seven Papers on Power Situation in Canada Were Presented at Meeting in Berlin

Canada, which occupies a leading position among world nations both in power, resources and in their utilization, was well represented at the Second Plenary World Power Conference which has just been concluded in Berlin, Germany.

Adequate preparations for participation in this Conference were made by a Canadian committee headed by the Honourable Charles Stewart, Minister of the Interior, as Honorary Chairman, and Dr. Charles Camsell, Deputy Minister of Mines, as Chairman. Seven papers dealing comprehensively with the power situation in the Dominion were prepared by authors thoroughly conversant with conditions as follows:—

Water Power Resources of Canada and Their Development, by J. T. Johnston, C.E., Director, Dominion Water Power and Reclamation Service, Department of the Interior, Ottawa.

Fuel Investigation and Research in Canada, by B. F. Haanel, Chief Engineer, Division of Fuels and Fuel Testing, Department of Mines, Ottawa.

Recent Trends in Water Power Development in Canada, by T. H. Hogg, D.Eng., Chief Hydraulic Engineer, Ontario Hydro-Electric Power Commission.

Generation, Transmission and Distribution of Electricity—Recent Practice in Canada, by Julian C. Smith, Vice-President and General Manager, Shawinigan Water and Power Company, Limited, and C. V. Christie, Professor of Electrical Engineering, McGill University.

Storage Reservoirs in Canada, by O. Lefebvre, D.Sc., Chief Engineer, Quebec Streams Commission.

Economic Aspects of Electrical Supply in the House and on the Farm, by F. A. Gaby, D.Sc., Chief Engineer, Ontario Hydro-Electric Power Commission.

Some Economic Aspects of the Hydro-Electric Industry in Canada, by G. Gordon Gale, Vice-President and General Manager, Gatineau Power Company, Limited.

The conference which extended from June 16 to June 25 was a success in every way, the technical sessions and social events being largely attended and carried through in a manner which reflected the greatest credit upon the painstaking arrangements made by the

(Continued on page 3)

PREPARATIONS ARE COMPLETED FOR PATROL

Annual Expedition to Arctic Islands Will Sail July 30—Sir Hubert Wilkins a Member

All details for the sailing of the Department of the Interior's annual patrol on board the ss. *Beothic* have been completed, and as in former years Mr. George P. Mackenzie of the North West Territories and Yukon Branch, Department of the Interior, will be in command, with Captain E. Falk as Ship's Master, and Captain L. D. Morin as Ice Pilot. Dr. D. S. Bruce will act as Ship's Doctor until the *Beothic* reaches Chesterfield, where he will take over the duties of Medical Health Officer there from Dr. L. D. Livingstone, who will return home on the ship.

Inspector A. H. Joy, of the Royal Canadian Mounted Police, will go North for the annual inspection of the police detachments in the Eastern Arctic at Bache Peninsula, Dundas Harbour, Pond Inlet, Pangnirtung, Lake Harbour, and Port Burwell. He will be accompanied by the following police officers who will relieve those who have completed their term of duty in the North: Corporals Stallworthy and Jacob; and Constables McKay, Dersch, Currie, Beaulieu, Foster, Margetts, Fisher, Lavoie and Yeomans. Several of the party already have had considerable experience in the North.

During his recent visit to Ottawa, Sir Hubert Wilkins, the famous Arctic and Antarctic explorer, expressed a desire to Mr. O. S. Finnie, Director of the Yukon Branch, to accompany the patrol. Governmental permission for Sir Hubert to go North has been granted, and he expects to return to Canada before July 30, on which day the *Beothic* sails. Lieutenant-Commander N. G. Ricketts, of the International Ice Patrol; Dr. Peter Heinbecker, who is studying the blood groups of the Eskimos; and Messrs. A. Y. Jackson and Lawren S. Harris, well-known Canadian artists, who are to paint a number of pictures of northern scenes for Government use, will also form part of this year's patrol. Dr. M. P. Porsild, Director of the Danish Government Scientific Station at Godhavn, Greenland, will return home on the *Beothic*.

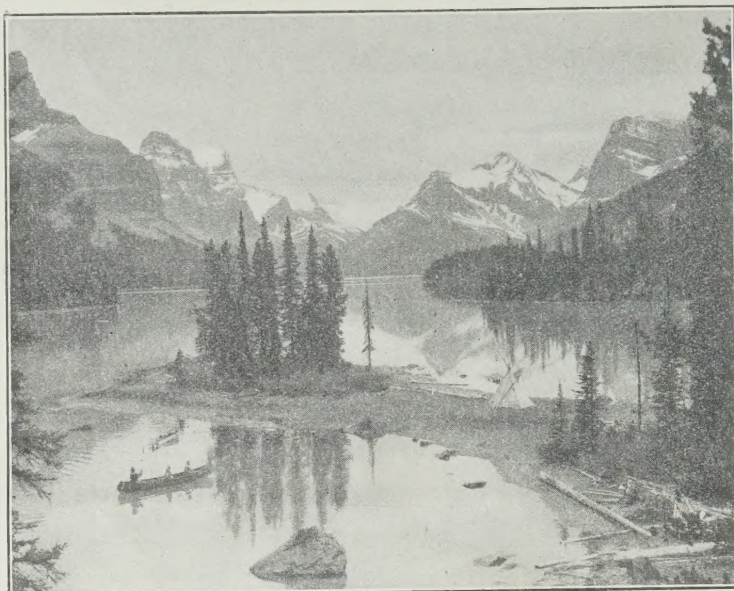
ALBERTA'S OIL PRODUCTION

Comparative Statement of Output in April, 1930, and Same Month Last Year.

Production of oil in the Alberta fields during the month of April totalled 92,404 barrels as compared to 74,844 barrels in the corresponding period last year, according to figures compiled in the Department of the Interior from the reports of operators. The naphtha production was from the lime formations in the Turner Valley, while of the total of 8,390 barrels of light crude produced, 5,617 barrels were from Turner Valley and the remainder from the Red Coulee field. The heavy crude came from the Wainwright field.

The comparative figures of production follow:—

	Naphtha Barrels	Light Crude Barrels	Heavy Crude Barrels	Total Barrels
April 1930.	83,052	8,390	962	92,404
April 1929.	68,262	5,611	971	74,844



Alpine Club's Annual Camp—The above photograph of beautiful Maligne lake in Jasper national park, Alberta, shows The Narrows where timbered points and islands practically divide the lake. The annual camp of the Alpine Club of Canada will be held in the Maligne Lake area beginning in July.

TO HOLD ALPINE CLUB'S 1930 CAMP IN JASPER PARK

(Continued from page 1)

Thorington, of Boston, and Mr. M. M. Strumia made first ascents of mounts Warren, Leah, Sampson, and The Thumb.

Of Maligne lake itself, much might be said. It is the largest and, some consider, the most beautiful of all the lakes in the Rockies. Eighteen miles long, its waters of a clear sapphire blue, with green shores as yet unsullied by human habitation, surrounded by glorious ice-hung peaks, the lake arouses the utmost enthusiasm. Midway in the lake lie The Narrows, where timbered points and islands close the view and practically divide the lake into separate sheets of water. Tall, graceful spruce trees stand out in bold relief at the water's edge, and in calm, sunny weather the reflections of the surrounding snow-clad peaks and sharp rock pyramids, overhung by billows of white cumulous cloud, are so vivid and realistic that it is difficult to know where land and water meet. The lights and shadows present a veritable heaven for artists and photographers; and even climbers, intent on their exacting work, are enthralled by the magic charm of the beauties that lie beneath them.

An auxiliary camp some six miles from the main camp at the head of Coronet creek will give access to the magnificent mount Brazeau (11,250 feet); the Brazeau glacier and lake; mount Valad; mount Henry Macleod (10,600 feet); and Coronet peak (10,000 feet).

The members will be divided into groups according to the proficiency of the climbers, and each group will be under the leadership of an experienced guide. Two Swiss guides who will lead parties making the most difficult climbs have been loaned by the Canadian National Railways. The successful ascent of designated peaks selected by the committee will entitle the member to the badge of the Alpine Club of Canada, while lesser climbs and easy expeditions will be arranged for those not so vigorous or ambitious.

The slow-growth black spruce of Northern Canada, on account of its consistent yield of cellulose, has proved to be the most valuable wood in the world for the manufacture of pulp used in rayon manufacture.

EXTENDS RADIO SERVICE IN CANADIAN NORTH

Department of the Interior Adds Four Stations to Its System

Four new radio stations are to be established in the Northwest Territories by the North West Territories and Yukon Branch of the Department of the Interior—namely, one at Norman on the Mackenzie river; one at Coppermine at the mouth of the Coppermine river, Coronation gulf; one at Chesterfield inlet, Hudson bay; and the fourth, a smaller one, at Herschel island, off the Western Arctic coast. These units will form part of the extensive system controlled by the Department of the Interior, which includes stations at Edmonton, Fort Smith, Resolution, Simpson, Aklavik, Dawson, and Mayo.

In this huge network there was a stretch of over 800 miles between Simpson and Aklavik, and it was found that this was too great a distance for efficient and uninterrupted service. The establishment of the station at Norman, about midway between Simpson and Aklavik, will greatly improve conditions. The new station will also be of valuable assistance to the recently inaugurated mail service. Moreover, Norman is an important strategic point, standing as it does at the junction of the Mackenzie and Great Bear rivers, and dominating the western area of Great Bear lake where there is such activity in prospecting for minerals. Another important fact about Norman is that it is on the shortest trail to Coronation gulf and the Coppermine, the region that is now attracting the attention of influential mining companies and prospectors.

The stations at Coppermine, in the heart of the Canadian Arctic, and at Chesterfield, on Hudson bay, will be of very great benefit to the administrative and medical services, to trappers, prospectors, missionaries, the Royal Canadian Mounted Police, traders, and others whose duties take them to these remote regions.

WILL ATTEMPT TO RE-CHARGE GAS FIELD

Interesting Experiment in Bow Island, Alberta, Field—Unique Features

A very interesting attempt is being made to recharge the depleted gas sand in the Bow Island, Alberta, natural gas field with some of the surplus gas now being produced in Turner Valley, in which project a keen personal interest is being taken by Hon. Charles Stewart, Minister of the Interior. For the area of this field that has been found productive, and bearing in mind the rather small closure of the structure, it has produced a very large volume of gas from a sand, near the base of the Benton Shales, having a thickness of thirty-five feet. In 1911 the Canadian Western Natural Gas, Light, Heat and Power Company, Limited, acquired a well that had been drilled by the Canadian Pacific Railway Company and, in all, some twenty-nine wells have been drilled to date. The gas was supplied to Calgary and other towns through a sixteen-inch pipeline, 170 miles in length and with a capacity of 39,000,000 cubic feet per day. Of recent years the sand has become considerably depleted and flooded, in parts, with water, but at the present time it does not have to be drawn upon, for its place as the main source of supply has been taken first by the Foremost field some twenty miles to the south, an area very similar to it geologically, and more recently by the Turner Valley field, where, as is well known, a large volume of gas is produced.

The injection of gas from other sands into a depleted horizon with a view to its storage therein, either from the point of view of convenience of locality for supplying peak load demands at other seasons of the year, or in the case of oil sands to assist in the removal of the oil, is no new practice but this is the first case where it has been attempted in Canada. The object here is to store surplus gas from Turner Valley that would otherwise be wasted and thus, it is hoped, build up a reserve for the future, which can be easily drawn upon through the existing pipeline as required. Two summers ago experiments were made on a smaller scale, using gas derived from the Foremost field. It was found that higher pressure than was then available was needed to force the gas into the sand and the necessary plant is now being installed to furnish this. If successful, this plant can eventually handle up to 50,000,000 cubic feet per day. It is generally found that higher pressures are required where water has encroached than is the case with similarly situated but dry sands.

Most of the wells, having been drilled many years ago, are not in the best condition to withstand very high pressure. Some of the wells will have to be abandoned and carefully plugged; others drastically repaired; and the remaining ones used for the actual injection of the gas. The project presents one difficulty that has to be overcome, in regard to which no existing experience has been gleaned elsewhere. That is the overcoming of the flooded condition of the field. Both the Dominion and Provincial Governments are affording the scheme every encouragement and Hon. Charles Stewart has placed one of the departmental engineers to study the work in the field and to keep the Department of the Interior fully advised as to its progress.

NATURAL RESOURCES
CANADAPUBLISHED BY
THE DEPARTMENT OF THE
INTERIORHON. CHARLES STEWART,
MinisterW. W. CORY, C.M.G.,
Deputy Minister

Natural Resources, Canada, is published monthly for the purpose of promoting interest and supplying information respecting Canada's natural resources and their development. Inquiries respecting any matter or document dealt with should be addressed to

The Secretary,
Department of the Interior,
Ottawa.

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OTTAWA, JULY, 1930

CANADA'S LEADING PART AT
WORLD POWER CONFERENCE

(Continued from page 1)

German organizing committee. At the conclusion of the technical sessions a series of official tours took the delegates through the picturesque countryside and important industrial centres of Germany and provided a fitting conclusion.

The World Power Conference in which forty-eight countries are represented was inaugurated by Great Britain in 1923 with a view to improving, from technical and commercial aspects, the methods of generating and distributing energy in every form and to promoting the use of energy by international collaboration. The first Plenary Meeting was held in London in July, 1924, and since then sectional meetings have been held—the Basle Conference (1926) which dealt with the Utilization of Water Power and Inland Waterways; the London Fuel Conference of 1928; the Barcelona Meeting (May, 1929) on Water Power Utilization; and the Tokyo Meeting (October, 1929) on the Development of Power Resources.

The objective of the World Power Conference is to provide an international organization through which the nations of the world may unite to consider power problems under four main headings—Engineering, Economics, Administration, and Education. The minimum waste of power, the most reliable methods for its utilization and the broadest field of application are the aims in power engineering. The opening of new markets for power and the improvement of such markets so as to provide a profitable field for investment are the aims in power economics. Equitable legislation tending toward the more extended use of power is the aim in power administration. To harmonize engineering and pure science in the art of power development and utilization is the aim in power education.

These periodical meetings afford an unrivalled opportunity to demonstrate to the world at large the position Canada occupies as a land of low-priced power with unlimited possibilities for industrial expansion and to the Canadians who are able to be in attendance opportunities to make international contacts which should be of greatest value in advancing Canadian power interests.

An influential delegation of Canadians was present at this year's Conference, comprising the following engineers and others widely representative of

ASSISTANCE IN MOVEMENT OF WESTERN COALS*

Hon. Chas. Stewart Announces Special Freight Rate on Alberta Coals to Ontario and Aid in Transportation of Western Coals to Manitoba

The Honourable Charles Stewart, Federal Minister of the Interior, and of Mines, has announced that the Dominion Government will render substantial assistance to the movement of western Canadian coals into home markets where coals imported from the United States have long held a competitive advantage.

An Order in Council has extended for another year the special freight rate of \$6.75 per ton for the transportation of Alberta coals to the province of Ontario where for the past three years coals moved from Alberta under this reduced rate have been replacing United States anthracite. This movement has for its object the furnishing of practical means for determining the lowest freight costs consistent with economic practice at which the coals can move and at the same time it encourages the use of Alberta coals as a household fuel in Ontario.

Another Order in Council opens the way for Alberta and southeastern British Columbia coals to strengthen their position in the markets of Manitoba. Although the Manitoba markets are geographically within the compass of these Canadian coal mines, United States coals from Pennsylvania and West Virginia, aided by extremely low rates for water transportation to the head of lake Superior, have been able to undersell the Canadian coals in such an important industrial market as the Greater Winnipeg area. This market absorbs close to ninety per cent of the coals sold for industrial consumption in Manitoba. The assistance given respecting Alberta and southeastern British Columbia and which is to apply from June 1, 1930, to May 31, 1931, provides for a reduction of one-eighth of a cent per ton per mile from the regular freight rates on coal shipments for industrial consumption and consigned to competitive points in Mani-

toba. The amount of the reduction is payable directly to the railways by the Government with a view to protecting the railways from any loss that may be incurred. Based on the distances of the different coal mines from Winnipeg the ton mileage reduction in freight rates means that the net freight cost to the shipper for sending western coals to that market will be reduced by amounts varying from \$1 to \$1.20 per ton, and this it is expected will remove the obstacles to the use of these coals in Manitoba.

In like manner the Government has rendered aid to the lignite coal industry of Saskatchewan. An Order in Council to be effective from June 1, 1930, to May 31, 1931, provides that the Government will pay 50 cents per ton of the freight rates on Saskatchewan lignite coal shipped to competitive points in Manitoba and used for industrial purposes, and by similar authority assistance is given to the transportation of carbonized lignite briquettes, during the same period, consigned to competitive points in Manitoba and used for both domestic and industrial purposes. In the case of the briquettes the reduction is one-fifth of a cent per ton per mile from the regular freight rates but is not to exceed 50 cents per ton. In recent years boiler equipment has been designed to burn efficiently and economically the lignite coals of Saskatchewan which increases considerably the prospects of utilizing them as industrial fuel. The Dominion Government has been interested for some considerable time in the question of carbonizing and briquetting lignite coals for domestic use and recently commercial interests have established a carbonizing and briquetting industry in Saskatchewan.

*Prepared at the direction of Mr. L. L. Bolton, Acting Deputy Minister of Mines, Ottawa, Canada.

WESTERN LAND SETTLEMENT

Substantial Increase in Number of Homestead Entries and Soldier Grants Made in May

A substantial increase in the number of homestead entries and soldier grants made during the month of May, 1930, as compared with the same period last year is noted in the figures compiled by the Dominion Lands Administration of the Department of the Interior. The comparative table follows:—

Agency	Homesteads 1929-1930	Soldier Grants 1929-1930
Calgary	58 38	3 1
Dauphin	36 43	.. 1
Edmonton	362 607	9 26
Grande Prairie	208 393	12 27
Kamloops	3 2	.. ..
Lethbridge	21 26	.. ..
Moose Jaw	167 91	5 4
New Westminster	5 5	.. ..
Peace River	268 404	16 25
Prince Albert	345 385	9 21
Revelstoke	3 1	1 ..
Winnipeg	29 40	.. 2
	1,505 2,035	55 107

Totals for May, 1929—1,564; for May, 1930—2,142.

northerly portion of Cape Breton island, and an area along the north shore of the gulf of St. Lawrence in connection with hydrographic work. This operation, it is hoped, will determine the extent to which aerial photographs may be used for underwater investigations of reefs and shoals in this district.

In the geodetic field the aeroplanes will continue to give assistance in transporting field parties and equipment and in taking photographs for the purpose of locating triangulation stations.

Canada has for years taken the lead in aerial photography and surveying, and this year's program upon which the world's largest aerial photographic fleet is now engaged will more than enable her to maintain that pre-eminence. Before the end of the season probably at least another hundred thousand square miles of our country will be recorded on photographic negatives.

The Forest Service will continue to carry on the work of forest fire protection in Manitoba, Saskatchewan, and Alberta, for the season of 1930, and for this purpose has arranged to continue the co-operative arrangements which it has had in the past with the Royal Canadian Air Force. In these three provinces the area over which the air patrol work is carried on approximates 100,000,000 acres of which a large portion is unmapped. For this purpose seaplanes and flying boats totalling twenty-one will operate to detect and suppress forest fire outbreaks. This number represents an increase of four flying boats over that required for last year's program. Also an improved type of suppression aircraft is being supplied. These machines will be capable of carrying greater loads and their better performance should add greatly to the efficiency of fire-fighting operations.

A Thrilling Mountain Drive

One of the most thrilling drives in the mountains of Western Canada is along the new motor road to the top of Mount Revelstoke in Mount Revelstoke national park, a reservation of one hundred square miles in British Columbia.

FLYING OPERATIONS IN CANADA

(Continued from page 1)

in Saskatchewan, in areas in the vicinity of Ladder lake, lac Ile-à-la-Croise, Peter Pond lake and lake Athabaska. In Alberta, an extensive area north of Edmonton will be photographed, and in the Northwest Territories, various districts of particular interest will be covered, particularly in the vicinity of the mineral discoveries around Great Slave lake. Two planes will be engaged in photographing northern waterways, starting from Fitzgerald in northern Alberta and continuing their work to Great Bear lake and the Coppermine river. Other routes will include the Hay, Liard, and Nahanni rivers as well as other rivers of the Mackenzie system which are being utilized by explorers and prospectors. Further aerial photographic work will, it is expected, be done in Wood Buffalo park south of Great Slave lake for the purpose of studying the feeding ground of the buffalo. In British Columbia, the program includes the southern part of Vancouver island, the Vancouver district, and extensive areas in the Sicamous and Quesnel districts.

The photographic flight which is operating in the Maritimes will it is expected be able to photograph, for geological purposes, an area in the

power affairs throughout the Dominion:—

Dr. Charles Camsell, Deputy Minister of Mines and Chairman Canadian Committee World Power Conference;

Mr. John Murphy, Electrical Engineer, Department of Railways and Canals and Dominion Railway Commission;

Hon. F. P. Burden, Minister of Lands, British Columbia.

Dr. O. Lefebvre, Chief Engineer, Quebec Streams Commission;

Mr. A. B. Normandin, Hydraulic Service, Dept. Lands and Forests, Quebec;

Dr. F. A. Gaby, Chief Engineer, Hydro-Electric Power Commission of Ontario;

Dr. T. H. Hogg, Chief Hydraulic Engineer, Hydro-Electric Power Commission of Ontario;

Mr. G. Gordon Gale, Vice-President and General Manager, Gatineau Power Company;

Mr. R. G. Gage, Chief Electrical Engineer, Canadian National Railways;

Mr. R. S. Lea, Consulting Engineer, Montreal;

Mr. John Morse, General Superintendent, Shawinigan Water and Power Company;

Mr. J. G. Glassco, General Manager, Winnipeg Hydro-Electric System;

Mr. De Gaspé Beaubien, Consulting Engineer, Montreal;

Mr. G. A. Gaherty, President, Calgary Power Company.

SEARCH FOR UNKNOWN PLANET TO BE RESUMED

Dominion Observatory Astronomers Will Continue Study in Autumn

On March 13 last the astronomical world was startled by the announcement of the discovery at Lowell Observatory, Flagstaff, Arizona, of a new planet circling around the sun far beyond the orbit of Neptune, hitherto the most distant known outpost of the solar system. The discovery was not accidental; minute irregularities in the orbits of Neptune and Uranus had aroused the suspicion that a disturbing body existed, and several astronomers had undertaken to predict its position approximately, from an analysis of the disturbances observed. Particularly at Lowell Observatory a persistent program of search had been followed for years, in the course of which the new body was discovered.

A planet at that distance from the sun, roughly some four thousand million miles, would take several hundred years to make a complete revolution around the central body. Under these circumstances several years would necessarily elapse before its orbit could be definitely determined. If, however, photographic images of the same body could be found and identified on plates taken in previous years at any observatory these would serve the same purpose.

A search was immediately begun by observatories which happened to have old plates of any particular region of the sky where the object should have been. The Dominion Observatory, Department of the Interior, at Ottawa, Canada. The difficulties were considerable because the plates were on a very small scale and the planet was of such faintness that it was questionable whether, with the exposure given, it would be recorded at all. Finally, on three plates taken in February, 1924, in a field crowded with innumerable stars a faint object was found which had evidently changed its position in the interval of about three weeks intervening between the first and last plates.

It was at first suspected that this was an early record of the Lowell planet. Observations had, however, been accumulating on the latter, and it was found that in 1924 it could not have occupied exactly the position in which the Ottawa object was found. It appeared therefore that the latter must be a hitherto unknown planet or comet.

On account of the small scale of the plates and the extreme faintness of the images, which were just at the limit of visibility, the measures of position which could be obtained were rather uncertain; the comparatively short interval between the observations adds to the difficulties in determining an orbit. If the object can be identified on other plates it will be possible to obtain further knowledge of it. At the time of writing, that region of the sky is too close to the sun for a search to be made and will remain so for several months. Later in the season fresh plates of longer exposure and on a larger scale will be made and the search continued.

The distance of the object, so far as can be judged from the material at hand, is nearly fifty times that of the earth from the sun, or somewhat greater than that of the Lowell planet. In

SILVER FOX RANCHING IN CANADA*

Growth of Industry Has Been Along Sound and Economic Lines—Its Present Status

Canada was the first to develop the breeding of silver foxes in captivity and she has so maintained her position in this respect that she is regarded as a world-leader by all other countries, whose representatives periodically visit the Dominion in search of knowledge and advice in the conduct of similar undertakings. While silver fox ranching has been exploited here and there

While there has been a larger sale of live silver foxes as breeding stock during the last few years than ever before, yet these animals represent only about 25 per cent of the silver foxes produced. The main function of silver fox ranching is the production of pelts. In fact, a large number of the ranches are no longer interested in the sale of live foxes. As a consequence there has been



Silver Fox Ranching in Canada—A litter of well marked silver fox pups on a ranch in Eastern Canada. The industry of raising silver foxes in captivity has grown steadily and has spread from Prince Edward Island to every province of the Dominion and beyond.

by individuals who have been stressing its financial possibilities, yet the industry as a whole has developed along sound and economic lines, due in the first place to the foresight of the pioneers and to the valid and conservative methods of the fox breeders of Prince Edward Island who nursed the silver fox industry through its infancy.

The Canadian National Silver Fox Breeders' Association is the largest breed society in the Dominion and registers annually a larger number of pedigreed animals than is to be found in any other species of live stock. The 70,883 silver fox pups born in 1929, and registered by this association, are descended from less than a score of silver foxes taken from the wild by the pioneer breeders. The remarkable growth of the silver fox industry is indicated by the figures of the last four years, taken from Canadian Live Stock records, of silver fox pups registered by the above association: 1926, 32,355; 1927, 39,767; 1928, 51,624; 1929, 70,883.

While Prince Edward Island is still the cradle and the home of the industry, silver fox ranching is being firmly established in practically every province of the Dominion and is operating on a very large scale, more particularly in the province of Quebec. Silver fox ranching has also become established in a great number of European countries, and heavy shipments of live foxes are made annually from Canada, 2,558 having been exported from Prince Edward Island alone in 1929.

1924 it was in the constellation Gemini and moving very slowly in a southeasterly direction.

a rapid increase in the number of silver fox pelts coming into the market, but, as the number has increased, a wider and more general interest has been shown in silver fox furs by the fur buyers and by the fur trade as a whole. This has resulted, generally speaking, in a steady increase in the prices obtained for silver fox furs. Of course, as was to be expected, the financial stringency of last autumn had a marked effect on the prices of all pelts at the December and January fur sales, but silver fox furs were less affected than any other class.

During the last two decades of the 19th century before foxes were raised in captivity, it has been estimated that between 2,000 and 3,000 silver fox pelts were placed upon the market annually. For the past two years over 100,000 silver fox pelts have been absorbed each year by the fur trade, and, as the number of captured wild animals has not increased, it is estimated that wild pelts comprise only about 2,000 of this number. This estimate is confirmed by the fact that at the different fur auctions pelts of wild foxes formed less than two per cent of the total offerings.

*Prepared at the direction of Dr. J. H. Grisdale, Deputy Minister of Agriculture, by Mr. G. Ennis Smith, Superintendent, Experimental Fox Ranch, P.E.I.

Yukon's Source of Silver

The Yukon's production of silver which is derived mainly from the silver-lead ores of the Mayo district, has been increasing during the last two years and will probably continue to supply an increasing amount in the future.

NEW PAMPHLETS ON CANADIAN NORTHLAND

Two Recent Publications by Department of the Interior Are Interesting and Informative

In order to keep the people of Canada informed of developments now proceeding in our Northland, Hon. Charles Stewart, Minister of the Interior, has arranged that the latest information be issued in clear and concise form. The publications noted below are now ready for distribution. Copies may be had free upon application to the Director of the North West Territories and Yukon Branch, Department of the Interior, Ottawa.

Southern Baffin Island: An Account of Exploration, Investigation and Settlement During the Past Fifty Years, collated and compiled by A. E. Millward, B.Com., B.A. This is a pamphlet of 130 pages with illustrations and maps, giving an account of exploration and settlement in the southern half of Baffin island since the transfer of the Arctic archipelago by Great Britain to Canada in 1880. The bulletin deals with the expeditions and patrols sent out to Baffin island first by the Department of Marine and Fisheries and later, and for many years now, by the Department of the Interior. The work of the Royal Canadian Mounted Police is also described. Particular attention is given to exploratory journeys in the interior of the island and about and across the large lakes, Netilling and Amadjuak. The exploratory work of the early traders, missionaries, and scientists is also touched upon and maps are included showing the routes of sixteen of these journeys. The illustrations show the character of the country, the inhabitants, their dwellings and modes of travel.

Coronation Gulf Copper Deposits, by L. T. Burwash, M.E., F.R.G.S. In this pamphlet of forty-one pages, Major Burwash gives the results of his inspection of the known mineralized areas in the Coronation Gulf and Bathurst Inlet districts. There are twelve full-page illustrations and three sketch maps. Major Burwash has spent many years in exploratory work in Northern Canada for the Department of the Interior and has devoted much time to the study of Eskimo living conditions, wild life, and transportation possibilities. This pamphlet covers his most recent work and also contains sections on methods of travels, routes, and equipment, food, and clothing necessary for trips into the North.

Fruit Growing in Canada

All kinds of fruit are successfully grown in all except the colder parts of the Dominion of Canada; but fruit-growing as a commercial industry is limited to certain well-defined districts, these being principally the Annapolis valley in Nova Scotia, the southern half of Ontario, and the valleys of British Columbia. The valley of the St. John river in New Brunswick produces apples on a commercial scale, and there are parts of Quebec, notably in the counties of Rouville, Huntingdon, Chateauguay, Jacques Cartier, and Stanstead where apple-growing is successfully practised on a commercial scale.

NATURAL RESOURCES CANADA

Published by DEPARTMENT OF THE INTERIOR, Ottawa

VOL. 9

AUGUST, 1930

No. 8

REPORT PROGRESS IN MOVEMENT OF REINDEER HERD

REACHED HUNT RIVER IN EARLY MARCH

Drive of Animals to Mackenzie Delta Halted for Fawning Season in Northern Alaska

Canada's herd of over 3,000 reindeer which started in December, 1929, on the 1,000-mile drive across Alaska and North-western Canada to the selected area east of the delta of the Mackenzie river is halted for the summer season on the Hunt river, having completed the first lap of the journey eastward. Satisfactory progress has been made in the movement of the animals purchased by the Department of the Interior through its North West Territories and Yukon Branch for the establishment of herds in Northern Canada to supplement the supplies of food and clothing of the natives along our Arctic coast. Many unforeseen difficulties arose during the early part of the drive which greatly retarded progress with the result that the halt for fawning had to be called considerably short of the objective—the Colville River valley. However, it is expected that when the movement is resumed in October much better progress will be made and that the herd will be delivered on the east bank of the Mackenzie early in the spring of 1931.

The herd began the long drive on December 16, from the assembling point on the Napaktolik river in western Alaska. It consisted of 2,890 females, 305 males, and 247 steers, the latter to be used as sled deer for transporting provisions and equipment and as a meat supply. The chief difficulty encountered by the Lapp and Eskimo herders in charge of the drive was the fact that the animals were for the greater part young and consequently intractable. The purpose in selecting the young animals was that as they had been only a short time on the range they would not be under the same urge as older animals to return to their former feeding ground. Storms during the winter months increased the troubles of the herders and it was only through the exercise of the greatest patience that it was possible for the herders and their dogs to keep the animals together. The "breaking" of some of the deer for the sled work also occupied a great deal of time along the route as it was necessary, in the "coaxing" method of directing the drive, to have a number of trained deer lead the herd while others brought up the rear. The herders and dogs travelled on

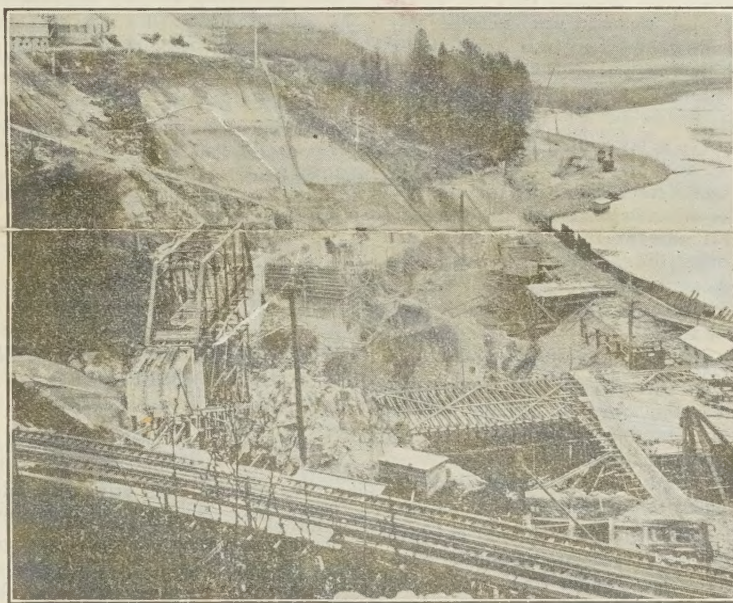
(Continued on page 2)

MID-YEAR WATER POWER REVIEW

Minister of the Interior Issues Half-Yearly Statement on Progress of Power Development

A mid-year review of the progress of water-power development in Canada to June 30, 1930, by the Minister of the Interior, indicates that at the present time hydro-electric construction amounts to a greater figure than at any previous period in the history of the Dominion. Installations aggregating more than 1,680,000 horse-power are under active development from coast to coast. Many

to have the initial installation, which will be about 80,000 h.p. in operation in 1932. A 220,000-volt transmission line will carry the energy to the Vancouver district. At the Jordan River station on Vancouver island a fourth unit of 18,000 h.p. is being added during the present year. On the mainland coast the Powell River Company has a new development under active construction on the Lois



Mid-Year Water Power Review—A view of construction work on the Ruskin development of the British Columbia Power Corporation on the Stave river, B.C. The ultimate designed capacity is 188,000 horse-power and it is expected that the first unit of 47,000 h.p. will be installed this year.

of these installations comprise the initial stages only of the respective undertakings and when such plants have reached their ultimate designed capacities a further 2,000,000 h.p. will be added to the Dominion's total. In the following paragraphs, the more important undertakings in the various provinces are touched upon.

British Columbia.—The British Columbia Power Corporation, through subsidiary companies, has important development work under way on the Stave and Bridge rivers on the mainland and on the Jordan river on Vancouver island. At Ruskin on the Stave river, rapid progress is being made with the construction of a development which, ultimately will have an installation of 188,000 h.p. The first unit of 47,000 h.p. is to be in operation by the autumn of the present year. On the Bridge river, work is steadily progressing on a project which will have an ultimate installation of 600,000 h.p. It is planned

river. The ultimate designed capacity is 44,000 h.p. of which 22,000 h.p. is being initially installed to be in operation in 1931. In the Prince Rupert district the Northern British Columbia Power Company is developing a site on the Falls river, at which an initial installation of 6,000 h.p. is being made, the ultimate designed capacity being 32,000 h.p.

Alberta.—The Calgary Power Company has completed its 132,000-volt transmission line carrying power from the recently completed Ghost development on the Bow river to Edmonton, a distance of 175 miles. The company is also spending considerable sums in extending its various transmission lines throughout the province.

Saskatchewan.—The first hydro-electric undertaking in the province was placed in operation on June 12, when power was delivered in Flinflon over a 58-mile transmission line from the

(Continued on page 3)

NATURE GUIDE SERVICE FOR NATIONAL PARKS

WILL INCREASE ENJOYMENT OF VISITORS

Hamilton Laing, Naturalist and Writer, is First "Nature Guide" in Jasper and Banff Parks

The Department of the Interior is introducing this year a new feature which should aid greatly in increasing the enjoyment of visitors to Canada's national parks. Mr. Hamilton Laing, the well-known naturalist and writer of the Pacific Coast has been engaged to act as a nature guide this summer in Jasper and Banff parks. During June and July he was stationed at Jasper Park Lodge and in August and September will be at Lake Louise and Banff. Mr. Laing's duties will simply be to open the eyes of the visitor to the interesting things which most of us miss and to explain their meaning. The parks are in reality our great outdoor museums, infinitely more interesting than the ordinary museum. If you have never seen the mountain goat before you will of course be interested in looking at a mounted specimen but how much more interesting to go out with a man whose trained eyes can pick one out 3,000 feet up a mountain side and take you to where you can observe its movements through field glasses and who will tell you as you go along something about its habits and family history.

For the man who knows, every trail is full of interest, but unless he is taught to look for them, the ordinary individual will pass unseeing by. On the road up to Maligne canyon in Jasper park there is a tall tree in which ospreys have nested for years and in the hatching season the little birds can be seen peeping over the edge of the nest while the parents fly to and fro bringing food for their voracious youngsters. The nest is in plain sight yet hundreds of visitors pass by it every day during the season without ever knowing it is there.

Mr. Laing's official title is "Nature Guide" and he is to act as an outdoor curator of the natural treasures and curiosities of the parks and introduce all who are interested, to the flowers, trees, birds, butterflies, and rocks which can be seen along the main trails within easy reach of the chief resorts. Mr. Laing is particularly well fitted for the task. He was born in Ontario, and grew up in Manitoba, spending several years teaching at Oak Lake. From his boyhood he was interested in natural his-

(Continued on page 4)

WHITE SPRUCE LEADS OUR COMMERCIAL TREES

Most Important and Most Widely Distributed of Dominion's Commercial Species

White spruce is the most important as well as one of the most widely distributed commercial tree species in Canada. It is found from the Maritime Provinces to British Columbia, and as far north as the mouth of the Mackenzie river within twenty miles of the Arctic ocean. It is one of the most northerly growing of Canadian trees. The white spruce is one of five native spruces. It is estimated by the Forest Service of the Department of the Interior that the total spruce stand, all species, in Canada is about 60,000,000,000 cubic feet of timber, or about 35 per cent of the total softwood stand. The estimate of white spruce is about 20,000,000,000 cubic feet, or one-third of the total spruce timber standing.

For its weight, white spruce is one of the strongest of Canadian woods. It is stronger than woods approximately its own weight, such as the white pine, and it possesses nearly the same relative strength, weight for weight, as the Douglas fir, one of the heaviest and strongest of Canada's woods. It has a fine, even grain, works easily under tools, is not prone to split, and has exceptional nail-holding qualities. In colour the wood is white, odourless, and comparatively non-resinous, qualities which make it valuable for the manufacture of food containers, such as butter boxes.

White spruce probably forms the greater part of the spruce lumber on the market, and its use has increased in recent years with the growing scarcity of white pine. It is used in greatest quantities by the manufacturers of building materials. Large quantities are used for siding, flooring, and roof sheathing, as well as for the manufacture of sash, door, and house trimmings. It is one of the leading woods in millwork of all kinds. Up to 1926 spruce ranked first in the amount of lumber produced annually, and it now ranks second only to Douglas fir. The average annual cut of spruce lumber is approximately 1,180,000,000 feet B.M. with a value of \$32,000,000.

The long, tough, almost colourless fibres of white spruce may be easily separated because of the comparatively non-resinous nature of the wood. For this reason and because of its wide distribution, it has become the leading Canadian pulpwood. Some 3,439,651 cords, with a value of \$43,245,062, were used in manufacture of paper pulp in Canadian mills in 1928. Spruce comprises from 65 to 75 per cent of the total pulpwood cut in Canada. The total value of the cut of spruce lumber and pulpwood in 1928 (latest figures available), was \$71,296,384. This amounts to approximately 35 per cent of the estimated total value resulting from forest products.

The white spruce in our forests occurs in pure stands, but is often mixed with red and black spruce, tamarack, birch, and poplar. It makes its best growth on well-drained, moist, gravelly soil, but is not exacting, for we find it in the forest, growing on rocky slopes, and on borders of lakes and streams. It reproduces itself well under favourable conditions, particularly where the soil conditions are such that the seed can readily come in contact with it, and where the overhead shading is not

TUNA FISHING OFF NOVA SCOTIA

Pastime Attracts Famous Canadian and United States Sportsmen—Development of Commercial Fishery

Far off in the sparkling summer waters a great fish suddenly takes the hook, 500 pounds or more of power and spirit and tenacity. The steel wire line "whirrs" fiercely from the reel. The battle is on! The battle between sportsman and a giant Nova Scotia tuna. If the fisherman relaxes skill or watchfulness for an instant, the battle will soon be over. The tuna knows all the tricks. If the fisherman continues unceasingly alert, the struggle will go on for hours before the great fish is brought conquered to the boat's side. And into this fight of hours there will be crammed a continual succession of thrills.

This is a glimpse of the sport of tuna fishing off Nova Scotia's coasts, where the largest tuna known to have been caught with rod and line was captured by Zane Grey, noted author, in 1924. Each year now sees these waters visited by prominent Canadian and United States sportsmen seeking—and finding—the excitement of this thrilling sport.

Fishing off Jordan bay, Shelburne county, in the summer of 1924, Mr. Grey caught three tuna, the largest weighing 758 pounds. That broke the best records previously made in California waters, where tuna fishing for sport has a large and enthusiastic following, and Mr. Grey's prize stands as the biggest tuna taken with rod and line. Of the other two fish which he captured in 1924, one weighed 736 pounds, and the other 684. Very large tuna have also been taken with rod and line in such waters as St. Ann bay, Cape Breton island.

Sport fishing for tuna is done from a boat, and "free rides" are often thrown in with the other excitement as the boat is towed here and there by the great fish as it fights to get away. A strong, sturdy rod is used, with heavy reel, and a line of fine, strong steel wire.

The fish is a giant of the mackerel family. Indeed, along the North Atlantic coast of Canada and the United States it has quite commonly been known as the "horse mackerel." Sometimes it has also been miscalled "albacore." The albacore, however, while quite similar to the tuna in appearance, is much smaller, rarely reaching a weight of more than thirty pounds, whereas specimens of the tuna taken in the commercial fishery have quite frequently been found to weigh a thousand pounds, or even more.

Tuna have been numerous along the coast of Nova Scotia for many years, but for a long time they were looked upon as a nuisance by the net fishermen, as they played havoc with the herring and mackerel gear in which they became tangled. There was little sale for them until recent years when a market was found among the Italian and Portuguese population of the United States, by whom they are regarded as prime food fish. Considerable shipments to the United States were made from time to time from the Clarke

too intense. It is one of our most valuable trees and well worth any efforts we make to maintain it in our forests by protection from fire, insects, decay, and wasteful cutting.

Harbour district of Shelburne county, and also from the Hubbards district of Lunenburg county.

No special efforts, however, were made to fish for tuna commercially until 1919, when trap-nets prepared for this particular purpose, were set in the St. Margaret Bay waters of Halifax and Lunenburg counties, chiefly during July and August. The operations met with gratifying success, nearly 600,000 pounds of fish being taken that year in two traps. The fish averaged about 450 pounds each.

This fishery is now definitely established in the Hubbards district of the bay. During 1927, for instance, about 600 tuna were captured by one trap operator, and in 1929, the marketed catch was 287,700 pounds. The total catch was considerably greater than this quantity, but since the available markets cannot always absorb the total quantity of fish caught, there is some difficulty in maintaining profitable prices, and when the catches are large the fishermen make only such shipments as promise a reasonable profit, liberating the other fish, which in the meantime have been kept alive in the traps.

The usual method employed by the commercial fishermen in marketing tuna is to cut off the heads and tails, after the fish have been killed and taken from the traps, remove the entrails, and ship each fish in a separate box. The transport is by rail to Yarmouth and thence by steamer to Boston.

REPORT PROGRESS IN MOVEMENT OF REINDEER HERD

(Continued from page 1)

each side of the herd to keep the animals from breaking out and scattering. On March 1, the drive was halted at Hunt river for the fawning season.

During the month of May an aeroplane reconnaissance of the route was made by Mr. Andrew Bahr, the chief herder in charge of the movement, and officers of the reindeer company. As a result the proposed route for the fall movement was chosen in a generally northeastward direction along the Redstone, Cutler, and Aniuk rivers. The divide will be crossed through the comparatively low Howard pass and the drive will then follow the Etivluk river, on the banks of which a cache of supplies has been established, to the Colville River flats. From there the route continues eastward across the tundra to the delta of the Mackenzie river in Northwestern Canada.

Preparations for the reception of the reindeer have been going forward rapidly. Mr. R. T. Porsild, of the North West Territories and Yukon Branch, has been in the North since early in the season, going in by aeroplane from Edmonton. Recent reports from him to the Director of the North West Territories and Yukon Branch state that the timber and lumber for the buildings, corrals, and other equipment have been moved to the site selected on the 15,000 square mile range east of the Mackenzie delta and everything will be in readiness when the reindeer arrive.

ADDITIONAL HISTORIC SITES TO BE MARKED

Department of the Interior Continues Work of Preserving Our National Historic Ruins

Since the year 1919, when the Historic Sites and Monuments Board of Canada was instituted, the Department of the Interior through its National Parks Service has marked, by the erection of suitable memorials, 150 sites appertaining to the history of the Dominion. From time to time, among the various sites acquired are those of Fort Wellington at Prescott, Ontario; Fort Chambly at Chambly, P.Q.; and Fort Lennox, near St. Johns, P.Q., on which are situated interesting structures erected by the French and the English for defensive purposes along the Richelieu and St. Lawrence rivers. Considerable restoration and improvement work has been carried out at these sites and to-day they are visited by streams of tourists. It is the intention of the Department of the Interior ultimately to mark throughout Canada all those sites that have a distinct bearing on the history of the Dominion.

During last year, among the number of monuments unveiled was one erected on the site of Fort Fork, near Peace River, Alberta, from which Sir Alexander Mackenzie set out on May 9, 1793, on his quest for the western sea, which resulted in the first crossing of the continent of North America.

The annual meeting of the Historic Sites and Monuments Board of Canada was held recently, Brigadier-General E. A. Cruikshank, a recognized authority on the military history of the Dominion, presiding. Other members in attendance were Dr. J. C. Webster, Shediac, N.B.; His Honour Judge W. Crowe, Sydney, N.S.; Mr. M. Nantel, Montreal, P.Q.; Dr. James H. Coyne, St. Thomas, Ont.; His Honour Judge F. W. Howay, New Westminster, B.C.; Mr. J. B. Harkin, Commissioner, National Parks, Ottawa; and Major A. A. Pinard, Secretary.

The following are among the most outstanding sites or events selected at the annual meeting for preservation and commemoration:—

St. Peter's Canal, N.S.—This canal connects St. Peter's bay with Bras d'Or lake, thereby shortening the distance to the eastern coast of Cape Breton. It was first surveyed in 1825, and completed in 1869.

At Bridgetown, N.S.—Site of the engagement at Bloody creek in 1757, during the Seven Years' War.

Temiscouata Portage, at Cabano, P.Q.—Here is one terminal of the longest and most difficult portage in the overland route between Acadia and Quebec. Over it the New Brunswick Regiment made its famous march in the winter of 1813, to aid in the defence of the Canadas.

Southwold Earthworks, near St. Thomas, Ont.—This is a unique example of a double-walled aboriginal fort. Its antiquity and origin remain unknown.

Near Brantford, Ont.—A tablet to commemorate the loyal services of the Six Nations Indians to the British Empire in the Seven Years War, the War of the American Revolution, and in the defence of Upper Canada in 1812-14.

Fort Mississauga, Niagara-on-the-Lake, Ont.—A tablet will be placed on this fort which was built by military labour in 1814 for the defence of the

(Continued on page 3)

NATURAL RESOURCES CANADA

PUBLISHED BY

THE DEPARTMENT OF THE
INTERIORHON. CHARLES STEWART,
MinisterW. W. CORY, C.M.G.,
Deputy Minister

Natural Resources, Canada, is published monthly for the purpose of promoting interest and supplying information respecting Canada's natural resources and their development. Inquiries respecting any matter or document dealt with should be addressed to

The Secretary,
Department of the Interior,
Ottawa.

This bulletin is also issued in French.
Articles may be reproduced with or without
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OTTAWA, AUGUST, 1930

MID-YEAR WATER POWER REVIEW

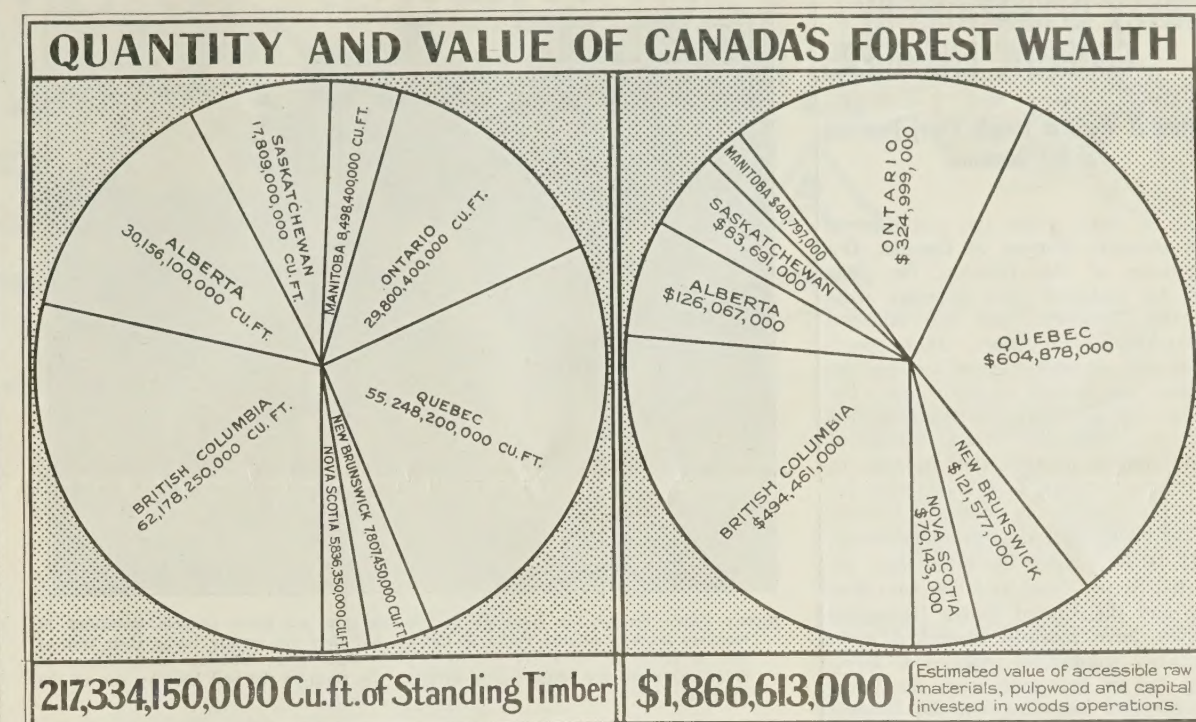
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42,000 h.p. installation of the Churchill River Power Company at Island Falls on the Churchill river. The transmission line carrying power from this development to the Sherritt-Gordon Mines on Cold lake will also soon be in operation. The plant at Island Falls is designed for an ultimate installation of 84,000 h.p.

Manitoba.—Good progress is being made in the construction of two large hydro-electric undertakings on the Winnipeg river. The Northwestern Power Company has a development under way at the Seven Sisters site which will ultimately comprise an installation of six units of 37,500 h.p. each, operating under a head of sixty-six feet. The initial installation comprising three units is expected to come into operation in 1931, and will be under partial head for a time producing about 40,000 h.p. At Slave Falls, the city of Winnipeg is making rapid progress with a new development which is designed for an ultimate installation of eight 12,000-h.p. units. The initial installation comprising two units is expected to go into operation about September, 1931.

Ontario.—The Ontario Hydro-Electric Power Commission is carrying to completion this year a 54,000-h.p. development at Alexander Landing on the Nipigon river from which power will be fed into the Thunder Bay system. Work is nearing completion on the installation of the tenth unit of 58,000 h.p. in the Queenston station on the Niagara river and it will go into operation before autumn. At Chats falls on the Ottawa river the Commission is jointly carrying out a 224,000-h.p. undertaking with the Chats Falls Power Company, the latter having a licence to develop on the Quebec side of this site. Work was commenced early in the year and the plant will probably be ready for operation late in 1931. In northern Ontario operations have been commenced on the construction of a 275,000-h.p. development at the canyon on the Abitibi river by the Hudson's Bay Power Company. In the Cobalt district the Canada Northern Power Company is bringing to completion a 13,000-h.p. plant at the upper end of the Notch on the Montreal river while on the Michipicoten river the Algoma District Power Company has recently added a unit of 11,000 h.p. to its High Falls plant.

Quebec.—The Beauharnois Light, Heat and Power Company is energetically pressing the construction of a development on the St. Lawrence river which



NOTE: A large percentage of the timber in the Prairie Provinces shown in the above diagram consists of poplar

What is the extent of Canada's stake in forest conservation?

In the latest official estimate of Canada's national wealth a value of over \$1,866,000,000 is placed upon the forests of the Dominion, including the "accessible raw materials, pulpwood and capital invested in woods' operations." That represents, so to speak, the estimated value of our forest capital. The value figures, as given in the right-hand diagram, based as they are upon present

stumpage values in the respective provinces, do not, of course, reflect the relative quantities of timber in the several provinces, which are shown in the diagram to the left. Colossal as the sum is, it covers only a part—possibly not more than half—of the total economic stake which the Canadian people have tied up in one way or another in forest resources, industry, and trade.

An annual expenditure of \$20,000,000 on research, protection and other forms

of forest conservation would mean an outlay equivalent to little more than one per cent of the value of our forest capital—a capital asset which under modern conditions is exposed to an exceptional degree to the forces of rapid destruction. And for any country having its economic life so vitally dependent upon forest resources and trade as is the case with Canada, forest conservation is nothing more or less than national business insurance.

will utilize the descent of some eighty feet between lake St. Francis and lake St. Louis. A power and ship canal approximately fifteen miles in length will lead the water from lake St. Francis to a 500,000-h.p. station located at lake St. Louis. The first units supplying 200,000 h.p. are to be in operation by October, 1932. The Shawinigan Water and Power Company has commenced construction of the first of a program of six developments on the upper St. Maurice river. This undertaking is located at Rapids Blanc and will have an initial installation of 160,000 h.p. The company is also constructing a storage dam at Toro rapids on the Mattawin river which will be the property of and be operated by the Quebec Streams Commission. As a result of this storage which will amount to 33,000 million cubic feet, the company is adding a unit of 25,000 h.p. to its Grand Mere plant and one of 30,000 h.p. at the La Gabelle plant, both on the St. Maurice river. At Chute à Caron on the Saguenay river about twenty miles below lake St. John, the Alcoa Power Company is making good progress in the construction of a hydro-electric undertaking, the first stage of which comprises the installation of four 65,000 h.p. units. The plant is expected to be ready for operation early in 1931. At High Falls on the Lievre river the James MacLaren Company has practically completed the construction of a 90,000-h.p. installation, the ultimate capacity to be 120,000 h.p. The undertaking also comprises a 25,000 million-cubic feet storage reservoir at Cedar rapids to be the property of and be operated by the Quebec Streams Commission. In addition to the development at Chats falls on the Ottawa river, which has already been mentioned under Ontario, other projects under active construction in Quebec include a 3,000

h.p. plant by the Ford Company on Ste. Anne river below St. Raymond and a 500-h.p. plant by the Cie Electrique de la Baie St. Paul near the latter village on the northwest branch of the Gouffre river.

New Brunswick.—The recently completed 60,000-h.p. development of the St. John River Power Company at Grand Falls on the St. John river commenced supplying power over a 104-mile transmission line to the newly constructed pulp and paper mill at Dalhousie of the New Brunswick International Paper Company. The town of Edmundston is enlarging its hydro-electric development on the Green river by raising the dam and by adding a new unit of 1,050 h.p.

Nova Scotia.—The Nova Scotia Power Commission has completed three new hydro-electric developments on the Mersey river, the first at Upper Lake falls with 7,600 h.p., the second at Lower Lake falls with 10,600 h.p. and the third at Big falls with 12,700 h.p. The Avon River Power Company has a new development under construction on the Black river where 4,500 h.p. is being installed. This plant is scheduled for completion late in 1930, and will be tied into the Avon River system near White Rock.

ADDITIONAL HISTORIC SITES TO BE MARKED

(Continued from page 2)

Niagara frontier. It was used as a military post until 1845.

Starting Point of the First Dominion Lands Survey, near Winnipeg.—To mark the site of the first survey monument erected in 1871 in connection with the establishment of the survey of Dominion Lands.

Churchill, Manitoba.—To mark the site of the fort built in 1689, then the most northerly post of the Hudson's

Bay Company, and the starting point of numerous Arctic explorations organized by the company.

Fort Chipewyan, Alberta.—To commemorate the voyage of Sir Alexander Mackenzie in 1789, from Fort Chipewyan on lake Athabaska northward to the Arctic ocean, and the discovery of the Mackenzie river.

Yukon Gold Discovery, Dawson City.—To perpetuate the memory of the indomitable prospectors who paved the way for the discovery in 1896 of the rich gold-fields of the Yukon.

OIL PRODUCTION IN ALBERTA

May, 1930, Output is Slightly Higher Than For Same Period Last Year

Alberta's output of oil during the month of May of this year was slightly higher than that for the corresponding period last year according to figures compiled in the Department of the Interior from the reports of operators. The 85,463 barrels of naphtha produced came from the lime formation in the Turner valley, thirty-nine wells contributing the total. The light crude came from higher horizons in Turner valley and from the Red Coulee field. The total production of light crude was from ten wells, three of which also produced naphtha. Four thousand seven hundred and ninety-seven barrels of light crude were produced in Turner valley in May, 1930. The heavy crude total consists of the output of five wells in the Wainwright field, one in the Ribstone field, and one in the Skiff area.

The comparative figures follow:—

	Naphtha (brls)	Light Crude (brls)	Heavy Crude (brls)	Total (brls)
May 1930.	85,463	7,649	2,115	95,227
May 1929.	82,240	6,926	1,019	90,185

SURVEY OPERATIONS BY GEODETIC ENGINEERS

Parties at Work in Nearly Every Province of the Dominion

As in other years the activities of the Geodetic Survey of Canada, Department of the Interior, for 1930, will be scattered over different areas of the Dominion and will embrace many and diverse phases. These operations will, as always, tend towards the welfare and benefit of the country because, by accurately determining the latitudes, longitudes, and elevations of many points in the wide expanse of Canadian territory, a basis is created for the construction of railways, canals, power plants, and kindred undertakings.

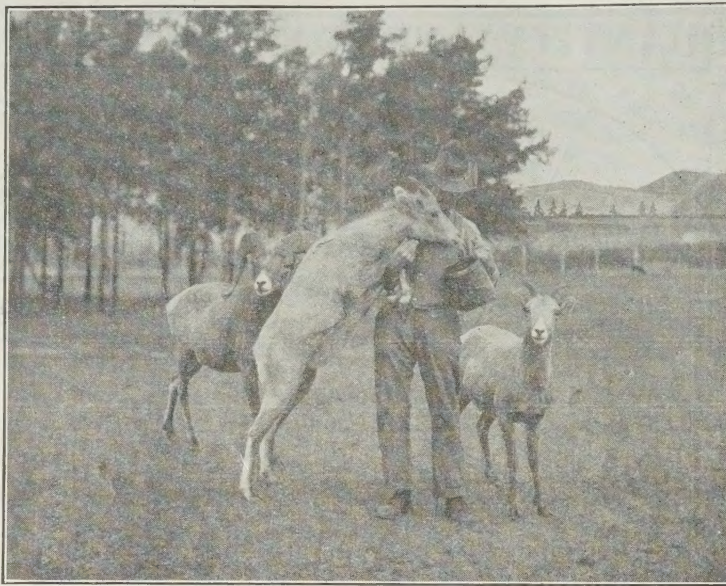
It is of interest to note that the United States Coast and Geodetic Survey and the United States Geological Survey have recently embarked upon a greatly augmented program of levelling and in this connection the latter organization has requested the Department of the Interior to have the Geodetic Survey of Canada extend lines of levels to the international boundary between Quebec and Maine and between British Columbia and Washington, in order to tie together the levelling of both countries. Efforts will be made to do this during the course of the season.

On Vancouver island precise level operations will be inaugurated from Nanaimo along the Esquimalt and Nanaimo Railway on the east coast and will be extended westerly to Port Alberni. Work on the completion of a loop of triangulation through central British Columbia and up the Fraser River valley will be carried on this year. It is expected that this loop will be completed in 1931 or 1932, and it will serve a long felt want by providing a basis for detailed map surveys.

Triangulation operations will also be carried on in the Prairie Provinces to complete a loop north of the international boundary, embracing such places as Calgary, Edmonton, Prince Albert, Saskatoon, and Regina. An extension of this triangulation net will also be commenced at Prince Albert.

The erection of fundamental bench marks, the massive concrete monuments established in public parks to preserve the determined elevations, is being prosecuted vigorously. Five of these will be erected at British Columbia points and two in the province of Quebec, as incidental to the work of the regular levelling parties. In addition a special party is being assigned to this work and will establish between fifteen and twenty fundamentals in Manitoba and northwestern Ontario; such places as Winnipeg, Port Arthur, Fort William, and Sudbury, being included in the program.

Triangulation of the important district from the town of Sault Ste. Marie eastward to Sudbury will be carried out this summer. This will be of the utmost importance to this highly mineralized region. The interests of Ontario will also be served by a precision traverse which will start from the town of Cochrane and go northward. This should prove of great value in the accurate determination of the coal areas recently discovered. Levelling parties will be engaged in old Ontario in the vicinity of lake Simcoe, northward from



Nature Guide Service for National Parks—Not only are game animals increasing in numbers in the National Parks of Canada but they are rapidly losing their fear of man as shown in the above picture taken in Banff park, Alberta. Rocky Mountain (Bighorn) sheep are endeavouring to reach the grain in the pail held by one of the wardens.

NATURE GUIDE SERVICE FOR NATIONAL PARKS

(Continued from page 1)

tory. His charming book "Out With the Birds" is the fruit of his ten years' observations and experiences in Manitoba. His newspaper articles on natural history subjects have been followed by nature lovers for many years. He is also a regular contributor to well known outdoor magazines in Canada and the United States. He has served as a naturalist on a number of important expeditions, including the United States Biological Survey expedition to mount McKinley. He has several times acted for the National Museum of Canada, at Ottawa, on other expeditions.

Mr. Laing has a delightful personality and the knack of reducing a great deal of scientific knowledge to simple and interesting form. Two or three years ago he moved to southern British Columbia and his recent articles from there have delighted nature lovers in both Canada and the United States. Mr. Laing will lead parties interested in studying the natural history features and will always be open for consultation with regard to the identity of objects observed by the visitors.

Orillia to Parry Sound, and eastward from Orillia as far as Cobocok.

Triangulation operations will be carried on extensively in the province of Quebec in conjunction with the International Pulp and Paper Company for forestry purposes. This work will be in the vicinity of Parent and will run westward as far as Nottaway on the Canadian National railway, eastward as far as Joybert, and southward to Mont Laurier. It thus embraces a part of the well known interprovincial highway which is being built for touring purposes. North from the town of Parent, investigations for the laying down of triangulation will be made so as to carry geodetic work as far as lake Chibougamau, which lies in a region well known for its mineral and power developments. Quebec will also be served by level lines along the St. Lawrence river between Montreal and Three Rivers.

The study of geodetic problems, such as the deviation of the vertical and the nature of the earth's crust will be carried out along the eastern coast of New Brunswick and in Prince Edward Island.

LAND SETTLEMENT IN THE WEST

Increased Number of Homestead Entries and Soldier Grants Made in June of This Year

The number of homestead entries and soldier grants made in Western Canada continue to increase according to figures compiled in the Dominion Lands Administration of the Department of the Interior. During the month of June, 1930, the number of homestead entries made was 2,360 as compared with 1,740 during the same period last year, while the figures for soldier grants during the same periods were 1930, 95; 1929, 74. One military bounty was granted in 1930 as compared with three half-breed scrips in 1929.

The comparative table follows:—

Agency	Homesteads		Soldier Grants	
	1929	1930	1929	1930
Calgary.	35	41	1	4
Dauphin.	40	95	..	2
Edmonton.	408	739	12	27
Grande Prairie.	340	313	15	17
Kamloops.	1	9	..	..
Lethbridge.	32	23	..	..
Moose Jaw.	117	92	8	2
New Westminster.	2	6	..	4
Peace River.	374	327	24	18
Prince Albert.	367	649	14	19
Revelstoke. . . . .	..	1	..	..
Winnipeg.	24	65	..	2
	1,740	2,360	74	95

Total for June, 1929—1,817.
Total for June, 1930—2,456.

Cape Jones

Cape Jones at the eastern entrance to James bay, in the province of Quebec, occurs on the map published in 1635, with the account of Capt. Luke Foxe's voyage to Hudson bay in 1631. Presumably the name commemorates Sir Thomas Jones, merchant and Lord Mayor of London, who is known to have subscribed liberally towards the expense of the Arctic expedition made by Bylot and Baffin in 1616. Some maps show a more modern cape Jones, south of Rankin inlet, on the west coast of Hudson bay, but the Geographic Board of Canada has for this approved the use of the Eskimo name Papik point, which will avoid confusion caused by the duplication of names in the same region.

A goodly number of water-fowl areas have been reserved as sanctuaries in the western provinces where so many of Canada's ducks breed.

CANADA AMONG WORLD LEADERS IN AVIATION

Department of the Interior Aiding in Advancement by Investigative Work on Aeronautical Instruments

Canada is one of the world-leaders in aviation. Owing to the vast areas to be covered and the characteristic climatic conditions of the north, the Canadian flyer has gained most valuable experience. This not only calls forth all the courage and stamina to be found in man, but also shows how urgent is the need for ever-progressive scientific instruments to guide him where his senses are thwarted by fog, darkness, and foul weather. The advance in scientific research, therefore, has been rapid and, at the present time the instrument board of an aeroplane is often adorned by more than twenty different dials, to be read by the aviator as the occasion demands.

In Canada the investigation, testing and standardization of aeronautical instruments is performed by the Physical Testing Laboratory of the Topographical Survey, Department of the Interior, which also carries on the maintenance of instruments used in the Government service. Laboratory tests, in which the conditions of temperature and air pressure are duplicated, reveal any possible source of error and cover a wide range of instruments, such as altimeters, air-speed indicators, magnetic compasses, engine-speed indicators, thermometers, pressure gauges, level-flight indicators, rate-of-climb indicators, and other types of recording appliances.

The altimeter, of course, is the most familiar to the general public. It is also the oldest, its prototype having been invented about 140 years ago to indicate the height attained by balloons. The altimeter is, in effect, a pressure gauge which registers the decrease in pressure as one ascends from the earth. However, owing to various atmospheric causes, the altimeter cannot be relied upon to give the true height from the ground at all times, hence scientific research is being focussed on the evolution of a perfectly reliable instrument. The same remark applies to all speed appliances, to the magnetic compass, and to the thermometers used for indicating the temperature of cooling water and lubricating oil. The last named instruments, which generally depend on the vapour pressure of some volatile substance like ether, are being replaced by mercury thermometers of the dial type which are almost free of altitude errors.

As an instance of the difficulties to be overcome in air transit, the figures indicated on the air-speed dial do not always show the true speed over the ground, because the indications on the dial depend also on the density of the air and upon the effect of the wind. So far as safety is concerned, however, the actual stalling speed (the speed below which the plane will become uncontrollable) is shown whatever the height may be, as the forces acting on the aeroplane also change with air density.

In order to provide illumination of the instruments for night operations, small electric lights are sometimes employed, but there is always the risk of failure of the current. Radium is the alternative and, as the instruments must be visible by twilight, luminous paint with high radium content is used.

NATURAL RESOURCES CANADA

Published by DEPARTMENT OF THE INTERIOR, Ottawa

VOL. 9

SEPTEMBER, 1930

No. 9

CANADA'S ANNUAL ARCTIC PATROL MAKES PROGRESS

IS VISITING POSTS ON NOR- THERN ISLANDS

Department of the Interior's Expedition
Experiencing One of Stormiest
Voyages on Record

Notwithstanding storms, heavy ice, and adverse winds, the work of re-provisioning the posts on the islands of the Canadian Arctic archipelago and making the annual patrol is proceeding. The steamer *Beothic*, which left North Sydney, Nova Scotia, with the Department of the Interior's 1930 expedition in charge of Mr. George P. Mackenzie of the North West Territories and Yukon Branch, has completed the northern leg of the voyage to Bache Peninsula, Ellesmere island, and is now engaged in visiting the posts on Devon and Baffin islands.

The *Beothic* sailed on the evening of July 31 with a party of administrative officers, scientists, and members of the Royal Canadian Mounted Police, for a voyage which will cover approximately 8,000 miles before the ship returns late in September. For the first part of the voyage through the gulf of St. Lawrence and along the Labrador coast fair weather prevailed and good progress was made. However, when the ship turned eastward for the crossing to the Greenland coast, heavy storms were met and for many hours the staunch vessel was badly buffeted. However, notwithstanding her heavy cargo, she weathered the gale and the expedition paid its usual call at Godhavn, the seat of the local Danish Government, on the morning of August 7, remaining there until four o'clock in the afternoon. As in previous years the visit of the Canadian expedition was the occasion for a public holiday. The Parliament of North Greenland adjourned for the duration of the call. Governor and Mrs. Rosendahl and other Danish officials and their wives were the guests of the officer in charge of the expedition on board the ship. The Canadian and Danish officials discussed matters of mutual interest touching on the work in the Arctic. Dr. Porsild, who returned to Greenland from Canada on the *Beothic*, disembarked at Godhavn.

Leaving Godhavn, the ship was headed northward along the Greenland coast on its dash to Bache Peninsula on Ellesmere island, the farthest north post. The weather during this part of the voyage was reported as dull, with strong north winds, a moderate sea, and

(Continued on page 3)



HONOURABLE THOMAS G. MURPHY
Minister of the Interior and Superintendent
General of Indian Affairs

In the new federal ministry the important Departments of the Interior and of Indian Affairs become the responsibility of Hon. Thomas G. Murphy, who is the Manitoba representative in the Cabinet. The administration of these departments requires special knowledge of Western Canada coupled with a broad view of the position which the subjects dealt with occupy in the economic framework of the nation. Hon. Mr. Murphy brings to his new task qualities and a fund of experience which particularly fit him for the post. Born in 1883 in the farming community of Edville in Northumberland county, Ontario, he received his public and high school training at Colborne and taught school for two years in the same county before taking up the study of pharmacy. He thus gained a good knowledge of Ontario municipal institutions which has been of such great use to him in later life. He had early felt the call of the West and in 1906 he went to Winnipeg and graduated from the Manitoba College of Pharmacy in 1911. He immediately entered into business in Neepawa, a town about 115 miles northwest of Winnipeg. He was soon drawn into municipal affairs and because of his abilities as a speaker and administrator his assistance was sought for work in the provincial and Dominion fields. During the war Hon. Mr. Murphy enlisted as a private. He was first assigned to duty in a field ambulance but later he transferred to the 259th Battalion, which was one of the two infantry units sent from Canada to Siberia. Here a year was spent in keeping order among an unruly population in an inhospitable climate. Upon his return to Canada Mr. Murphy again entered public life and in the years 1921 to 1923 was a councillor, and in 1924, mayor, of Neepawa. He was elected to the House of Commons for the constituency of Neepawa in 1925, defeated in the election of 1926, and returned with a large majority in 1930. The electoral division of Neepawa was formed in 1914 out of several other ridings, including Marquette and Portage la Prairie, from each of which, it will be recollected, came Ministers of the Interior—Hon. Dr. W. J. Roche and Hon. Arthur Meighen. It is a large constituency, measuring 78 miles from north to south and 48 miles from east to west, and the representing of this field, along with his other public duties, has brought Hon. Mr. Murphy into touch with a large section of that virile population which is building up the Canadian West.

Hon. Mr. Murphy has unbounded confidence in the ability of Canadians to develop the magnificent resources of the Dominion and will devote his faith and energy to hastening the realization of this Canadian ideal.

CANADA'S GAME RESOURCES ARE WELL CONSERVED

HUNTING ATTRACTS MANY VISITORS

Coming of Autumn Brings Thousands to
Wooded Areas of Dominion For
Season's Sport

As autumn advances and the hardwoods turn to red and gold "the call of the Red Gods" will be heard and answered by thousands of sportsmen throughout America, many of whom are already busily engaged in planning their annual outing.

Notwithstanding the fact that serious inroads have been made on many species of game native to North America through the advance of settlement and development, there still remains in the vast wooded and unsettled portions of Canada an abundance of wild life. Thanks to wise legislative measures and strict enforcement of laws these valuable resources have been protected and conserved and game is well distributed throughout practically every province from the Atlantic to the Pacific. Owing to the vast area of the hunting districts and the varying climatic and geographic conditions, the species to be found varies with the character of the country but everywhere there will be found a plentitude of the game animals and birds best adapted to that specific range.

The provinces of Nova Scotia and New Brunswick are noted for their moose and deer but in addition there is to be found a goodly supply of bear, wildcat, and rabbit, also duck, woodcock and other upland and shore birds. These provinces are very popular with sportsmen from the large centres of population in the east as well as others from all over America who enjoy the less strenuous hunting trip. The hunting areas may be reached with ease, the services are well organized, and the sportsman may enjoy many of the comforts of civilization while on the hunting grounds. The number and excellence of the trophies taken each year keep these provinces well in the forefront of the popular hunting areas of America.

The provinces of Quebec and Ontario are the largest in the Dominion and they also attract the largest number of hunters. The vast areas of wild and forested lands in the northern sections of these provinces provide ideal cover and feeding ground for the plentiful supply of moose, deer, bear, and lesser

(Continued on page 4)

WINNIPEG RIVER DEVELOPMENTS

Good Progress Being Made in Completion of Seven Sisters Falls and Slave Falls Power Plants

There are two hydro-electric developments under construction on the Winnipeg river in Manitoba, both of which are expected to come into operation in 1931. The first of these to be undertaken was that of the Northwestern Power Company, a subsidiary of the Winnipeg Electric Company, at Seven Sisters Falls, and the second that of the city of Winnipeg at Slave Falls, about five miles downstream from the city's existing station. Both developments are being carried out under the terms of interim licences issued by the Department of the Interior after full consultation with the Manitoba authorities.

The Seven Sisters site is located on the main channel of the Winnipeg river immediately above the mouth of the Whitemouth river and the works under construction consist of a powerhouse, sluice-gates, and spillways across the bed of the river and connected by non-overflow sections to, the main banks of the river on each side. These main works are of reinforced concrete and connect with low dykes which parallel the river banks for some distance. These dykes are rendered necessary by the fact that for about four miles upstream the general elevation of the country is low and without them flooding would be extensive. The only remaining feature of the works is the excavation of a tail-race through the rapids below the power site.

The ultimate installation planned will consist of six units of 37,500 horse-power each operating under a head of 66 feet and utilizing the complete flow of the river. The interim licence provides that the Winnipeg Electric Company's plant on the Pinawa channel, completed some twenty-five years ago, shall be dismantled and the flow diverted for its operation turned back to the main channel for use at the new development. It is expected that the Seven Sisters plant will come into operation with three units operating under partial head and producing 40,000 horse-power. The complete head will be attained when the tail-race is excavated to its full capacity and the dykes are completed.

At the present time the non-overflow concrete portion of the dam is nearly completed, one-half of the spillway section is nearly up to the roll-way elevation, leaving the piers and deck to be completed, whilst the intake of the powerhouse is well advanced and the scroll-cases for the three initial units are being poured. The work is progressing rapidly and upwards of 1,100 men are engaged thereon.

The Slave Falls development is being constructed a short distance below the actual falls where an island divides the river. The principal works are located on the east channel between the left bank and high ground on the island. They are of reinforced concrete. Beginning on the left bank of the river the works consist, in order, of a spillway, non-overflow section, powerhouse, spillway, and sluice-ways. The west channel will be closed by a rock-fill dam. In addition flow to the powerhouse will be improved by the excavation of a channel through rock at Slave falls, this rock being available for use in the concrete-aggregate and rock-fill dam. The ultimate designed capacity

of the development is for eight 12,000-h.p. units, and the initial installation will consist of two units.

At the present time about 850 men are employed and the concrete sub-structure of the west half of the powerhouse is well advanced, whilst the spillway adjoining it on the island is nearly completed.



Winnipeg River Developments—The above photograph of the city of Winnipeg's power development at Slave falls shows the progress made with the powerhouse and spillway. The view is from the downstream side of the development. The ultimate designed capacity of this plant is for eight 12,000 horse-power units.

These two developments will provide a much-needed increase in the supply of electricity to Winnipeg and southern Manitoba and are providing occupation for a large body of men.

NEW MONTHLY RECORDS IN ALBERTA'S OIL PRODUCTION

Total For June Highest on Record—Naphtha Output Increases

New records in oil production in Alberta were established during the month of June according to figures compiled in the Department of the Interior based on the reports of operators. The total output of oil was the highest for any month to date, exceeding the previous record total set in March, 1930, by about 1,300 barrels. The production figures of naphtha in Turner Valley field and of light crude from Red Coulee field during June, 1930, were the highest so far. Turner valley also produced 4,414 barrels of light crude, the remaining 3,282 barrels of the June total coming from the Red Coulee field. The output of heavy crude during the month was as follows: Wainwright, 722 barrels; Ribstone, 323 barrels; and Skiff, 1,199 barrels.

The comparative figures for production during June, 1930, and the same period last year follow:—

	Naphtha Barrels	Light Crude Barrels	Heavy Crude Barrels	Total Barrels
June, 1930 . .	100,719	7,696	2,244	110,659
June, 1929 . .	90,227	3,865	2,700	96,792

Commissioners lake in Lake St. John county, Quebec, was named in 1828, after the commissioners who were appointed in 1827, to explore the Saguenay region.

CANADA AT MINING CONGRESS

Our Leading Place in World's Production of Minerals—Dr. Charles Camsell, Canada's Representative

"Canada's record of mineral production and of mining expansion is one of rapid and fairly steady progress. It is mainly a story of the discovery and development of mineral deposits coincident with the march of exploration and progress, the trend of which now seems to be definitely established toward the northern parts of the Do-

mining and its allied industries has been steadily maintained, not only in quantity production and increased variety of output but also in improved technical methods, until to-day mining ranks next to agriculture and forestry as the third of Canada's great primary industries.

"Some idea of the extent of the growth and of the present importance of the Canadian mining industry may be obtained from the following summary of progress. In 1900 the total annual mineral output of the Dominion was valued at \$64,420,877; in 1910 it had risen to \$106,823,623; in 1920 to \$227,859,665; and in 1928 a new high record of \$273,446,864 was reached, surpassing the previous high record values of 1926 and 1927. . . .

"Only in recent years has Canada's international status as a producer of minerals been established. In the period between 1886 and 1926 the Dominion secured practically complete control of the world's nickel markets, ninety per cent of whose requirements it now supplies. Canadian asbestos still supplies the largest part of the world's demand for this commodity, and Canada may almost be considered as the industrial mother of the metal cobalt. The output of the Porcupine and Kirkland Lake districts of Ontario has placed Canada third amongst gold-producing countries, and at the moment of writing the Dominion takes third place in the production of silver, fourth in the production of lead and copper, and also supplies a considerable portion of the world's zinc. More than forty primary metals and minerals are listed in the federal production statistics and of these the metals and other minerals referred to above, together with coal, natural gas, petroleum, gypsum, salt, platinum and palladium, are all of outstanding importance. With the aggregate annual mineral output of the Dominion now well over a quarter of a billion dollars it may be said with confidence that the Canadian mining industry is at present soundly established. . . .

"In the field of metallurgy Canada continues to keep pace with the advance made in its basic mining industries. The progress in milling practice, in concentration methods of ore treatment, and in metallurgical practice of ore reduction has been to some extent responsible for the increased output of the metals. The development of hydro-electric power, so rapidly extending throughout the Dominion, is making it possible to carry on mining operations on a larger scale and with decreased tonnage expenditures, to treat and reduce the ores more cheaply, and to produce pure electrolytic refined metals in competition with other countries. An increasing proportion of the total output of Canadian ores is being refined in the Dominion.

"A marked increase has been noted in recent years in the number of plants engaged in the chemical manufacturing industries. In Canada, as in other progressive countries, the tendency is to force the product of the mine to yield the largest possible contribution to the national welfare, and as a con-

minion. Vast areas of potential mineral interest still await the coming of the explorer and prospector, and it is reasonably within the bounds of possibility that much more mineral wealth lies undiscovered in the north than has yet been developed. These various factors combine to strengthen Canada's position as a mining country and to indicate a splendid future for her mineral industries."

With the above paragraph Dr. Charles Camsell, Deputy Minister of Mines, and Canada's representative at the Third Empire Mining and Metallurgical Congress, in South Africa, closed his introductory remarks to the "Review of the Mining Industry in Canada," presented by him at the Congress meeting. The Congress opened in Capetown, South Africa, on March 24, and meetings were also held in Kimberley, Johannesburg, Bulawayo, and Durban, the closing session taking place in Capetown on May 9. Nearly 250 delegates representing every part of the British Empire attended. Plans for a stock-taking of the mineral resources of the Empire were formulated, an exchange of views afforded, and opportunities provided for a close-range view of every phase of mining in South Africa.

A series of papers covering mineral production and mining activity in every part of Canada prepared by leading authorities in the Dominion was presented by Dr. Camsell. In his introduction, Dr. Camsell said in part:—

"The development of the Canadian mining and metallurgical industries to their present status is of comparatively recent date. For many years the term 'Granary of the Empire' symbolized the more important economic assets of the Dominion, and it is only within the past twenty years that mining and metallurgy have appeared as factors of growing importance on the national industrial horizon. During this period progress in

NATURAL RESOURCES CANADA

PUBLISHED BY

THE DEPARTMENT OF THE
INTERIORHON. THOMAS G. MURPHY,
MinisterW. W. CORY, C.M.G.,
Deputy Minister

Natural Resources, Canada, is published monthly for the purpose of promoting interest and supplying information respecting Canada's natural resources and their development. Inquiries respecting any matter or document dealt with should be addressed to

The Secretary,
Department of the Interior,
Ottawa.

This bulletin is also issued in French.
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OTTAWA, SEPTEMBER, 1930

CANADA'S ANNUAL ARCTIC PATROL MAKES PROGRESS

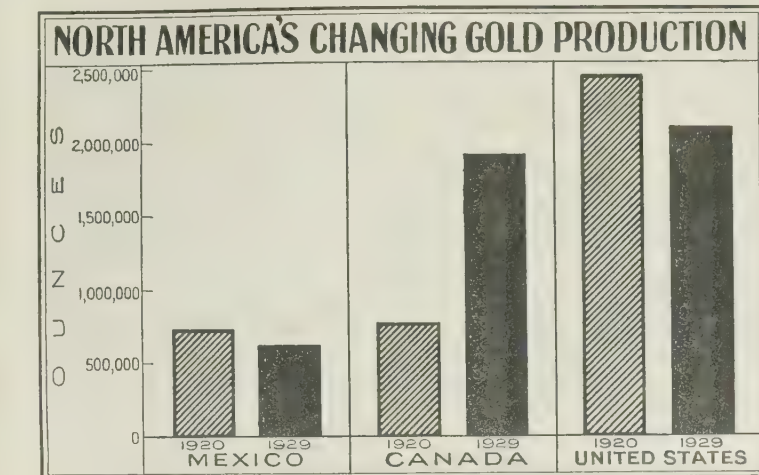
(Continued from page 1)

little ice but bergs. On August 10, the further progress of the *Beothic* was prevented by the ice which blocked Smith sound. By eight o'clock on the evening of the 11th she had worked her way through the barrier to Fram Havn, where the members of the Bache Peninsula detachment, Constables McLean, Beattie, and Fraser were waiting to greet the expedition. Then began a five days' battle with the floes in Buchanan bay in an unsuccessful attempt to reach Bache Peninsula.

Hours of following tiny leads, forcing openings, retreating, and advancing brought the *Beothic* within ten miles of the post on August 12 only to have the terrific pressure of the ice necessitate the withdrawal of the vessel to the protection of Fram Havn. Inspector Joy of the Royal Canadian Mounted Police, on his annual tour of inspection, boarded a small boat and by taking advantage of the clear water between the shore and the grounded ice was able to reach the post. However no amount of effort could bring the ship to its objective and on the 16th, after reaching a point within fifteen miles of Bache Peninsula, where twelve tons of the supplies for the post were landed, the ship returned to Fram Havn, and hope of reaching the post was abandoned. The remaining supplies were unloaded at this point and the ship bade farewell to the three officers of Canada's most northerly police detachment.

Storms which swept the *Beothic* from stem to stern retarded the progress of the ship on its southward voyage through Smith sound and Baffin bay to the post of Dundas Harbour, Devon island. The ship arrived at Dundas Harbour on August 19. After unloading supplies at this point the *Beothic* began the attempt to force her way westward through the ice to Winter Harbour, Melville island. On the evening of August 21 the ship had reached Claxton point, on the south coast of Cornwallis island; on the 22nd she had worked her way into Austin channel about ten miles west of Cape Cockburn, Bathurst island, where she was held in the grip of the immense ice pans moving south until the 24th. On that date the ship was able to force her way a scant fifteen miles farther.

At six o'clock on the evening of August 25 the *Beothic* was five miles south of Cape Cockburn, evidently having had to change her position owing



North America is, next to Africa, the chief gold-producing continent, usually contributing about one-quarter of the world's annual gold output. Within the past decade the North American production of the yellow metal has rather more than held its own, but this showing has been due entirely to the fact that Canada's rising output has been sufficient to offset the declines in the United States and Mexico. Ten years ago the gold output of the United States was three times as great as that of the Dominion. To-day the two countries are almost on a par in that regard.

to the pressure of the ice. An easterly wind opened up a passage along Bathurst island which was followed to Schomberg point, but as no way could then be found around the impenetrable barrier to the west, the expedition was forced to abandon for this year the attempt to re-provision the cache at Winter Harbour.

The return trip was a desperate struggle to get clear of the tremendous pans of grinding, crushing ice in time to complete the round of the posts to the south. On the 26th the *Beothic* had reached Griffiths island, south of Cornwallis island and midway through Barrow strait. The strait was full of ice through which the ship was forcing a way. On the 27th she was clear of the ice and heading for Pond Inlet, Baffin island.

CANADA AT MINING CONGRESS

(Continued from page 2)

sequence the interdependence of the mining, metallurgical, and chemical industries is becoming much greater than formerly. Modern chemical processes are turning into industrial channels materials formerly entirely wasted, and are increasing the economic value of raw materials formerly wastefully consumed. Very considerable quantities of materials formerly allowed to escape from smelter flumes are being turned to industrial uses and contributing appreciable sums to the smelter revenues. The most remarkable development along these lines is found in the processing of coals, in which the application of scientific research is making good headway toward the solution of one of the most urgent problems of the present day. This is also one of the major problems related to mining development now being investigated by the Dominion Department of Mines at Ottawa. The chemical industry and many other industries are directly or indirectly dependent upon mining, and the progress made along these lines amply indicates the growing importance of mining in Canada's industrial development. . . .

The comparatively negligible loss suffered by forest fires in 1929 in New Brunswick and Nova Scotia is attributed to the permit system in vogue, increased care on the part of the public, and to the increased effectiveness of the protective organizations in these provinces.

POINTE DES MONTS ON ST. LAWRENCE RIVER

Geographic Board of Canada Gives Explanation of Origin of Name

On the north shore of the St. Lawrence river in Saguenay county, Quebec, is a well known promontory which on maps is designated "pointe des Monts." The statement has received wide currency that the name commemorates the Comte de Monts who in 1603 became head of the company formed by Champlain to plant colonies in New France. The point indeed is mentioned by Champlain, but without name nor does it appear by name on any of the explorer's maps. The earliest map in the collection of the Geographic Board of Canada on which the name appears is one drawn by Deshayes and published by N. de Fer at Paris about 1695. This map and numerous succeeding ones call the point "pointe des Monts Peles" and the hills in the background "Monts Pelez." Pele means "bald" and describes the absence of vegetation on the hills. There seems no reason to doubt that the modern name of the point is a shortened form of the original name which means "point of the bald mountains"

Communication in the Far North

The Canadian Air Mail Service established a record for communication with Canada's Northland, when the through initial air mail flight from McMurray, Alberta, to Aklavik, N.W.T., was recently completed in eleven hours running time—a distance of 1,676 miles. The revolutionary speed of this accomplishment, as compared with former methods of land and water communication, may be gauged when it is pointed out that the scheduled time of the winter service was formerly about 73 days between the points mentioned and the summer service, 15 days.

Test Instruments of Precision

The Physical Testing Laboratory of the Topographical Survey, Department of the Interior, which was originally established for testing the surveying instruments for that organization, in addition does work for many other Dominion Government organizations in testing, calibrating, designing, and repairing instruments of precision for scientific work.

DOUGLAS FIR A LEADER IN STRUCTURAL WOODS

Interesting Facts About One of Canada's Most Important Timber Trees

The Douglas fir at present produces one of Canada's most important woods. It is a western tree and in Canada is confined to British Columbia and the eastern slopes of the Rocky mountains in Alberta. Although restricted to a narrow geographical range, it ranks sixth in the estimated amount of standing timber of merchantable size in this country, and its wood has found a wider range of foreign markets than any other native species.

Tests made by the Forest Products Laboratories of the Forest Service, Department of the Interior, show the Douglas fir to be one of the strongest and stiffest of Canadian woods. For this reason, and because it occurs in large sizes, it is our leading structural timber. It attains a larger size than any other tree in Canada. Not infrequently trees of a height of 250 feet and a diameter of 10 feet have been found. Trees scaling over 75,000 feet board measure are sometimes cut.

There are few timbers in the world which serve as many wood-using industries as does this species. It is used extensively for the construction of bridges, wharves, and factories where timbers must be strong enough to resist the application of sudden, heavy loads. Its ability to withstand sudden strains makes it much in demand for beams, ship-knees, keels, decking, masts, spars, and planking in ship construction, while its hardness and resistance to abrasion increase its value as material for flooring, especially when cut edge-grained. When cross-sawn, the wood blocks provide a long-wearing pavement for roadways.

The grain of Douglas fir is pleasing, and rotary-cut veneer possesses a particularly beautiful figure. For this reason, and because the wood can be smoothly finished and takes stain, varnish, and paint with ease, it is much sought for interior finish, panelling, and cabinet work. Its comparative lightness combined with its strength make it a valuable wood in the manufacture of agricultural implements. Douglas fir is fairly durable and therefore suitable for telephone poles, fence material, and railroad ties.

Although botanically there is only one species of Douglas fir, there are some marked differences in size and general qualities of the trees growing in the mountains of inland British Columbia as compared with those found in the moister climate of the Coast region. The Coast tree reaches a larger size and is more rapid in growth.

Practically pure stands of Douglas fir are found but it also occurs in stands mixed with Western hemlock, Western red cedar, Sitka spruce and minor species. It thrives best on well-drained soil, and where the climate is moderate and not subject to extremes. Under favourable conditions, where the seed can reach mineral soil, it reproduces prolifically and there is no reason why Canada should not go on indefinitely supplying the world's market with this valuable wood, provided cutting is wisely regulated so that young growth may be encouraged, and provided also that forest officials secure the full co-operation of the public in protecting it against fire.

TRAIL RIDERS VISIT NEW SCENIC AREA

Hold Annual Ride Over Recently Completed Trail Through Banff and Kootenay National Parks

An organization which is doing much to open up unknown districts in the national parks is the order known as "The Trail Riders of the Canadian Rockies." This brotherhood of the mountain trails has been in existence a little over six years and during that time it has opened up many regions hitherto closed to the tourist, giving its hundreds of members an opportunity of seeing remote and beautiful parts of the mountains and thus adding to the general knowledge of the topography of the Rockies. This year, on its annual ride, which was held from July 31 to August 4, the party took the new trail just completed by engineers of the National Parks Branch, Department of the Interior, across Ball pass.

Starting at Massive, on the Banff-Windermere highway, in Banff national park, the route led by Redearth creek to beautiful Shadow lake, which lies under the towering mass of mount Ball, the most picturesque peak of the region. Up to this point the country was known. Beyond Shadow lake the trail-riders followed the new trail up Haiduk creek to Ball pass (7,300 feet in altitude), a hitherto unused crossing of the Great Divide. The scenery on the ascent was magnificent, with snow-crowned mount Ball towering to the right in a sheer rock escarpment 4,000 feet high and far-reaching views of the Bow valley below. Good grades were found to the pass and the ascent was not difficult. The actual summit is a perpendicular wall of rock 100 feet high which appeared at first to offer insurmountable difficulties for the construction of a trail. By building a switchback around the scree at its base, however, National Parks engineers overcame this barrier and it is expected that this will now form one of the most interesting trail rides in the vicinity of Banff.

Crossing the summit the trail turns southeasterly and connects with the trail up Hawk creek, in Kootenay national park. Dropping down this valley the trail follows the stream to its junction with the Vermilion, a short distance from the Banff-Windermere highway. Crossing the highway, the party took the trail up Floe creek to Floe lake, thence above timberline along the rock wall of the Vermilion range of mountains, with their hanging glaciers, to the Wolverine plateau.

Camp was made here in an alpine meadow covered with flowers and white heather. The return was made by Tumbling Creek valley to Marble canyon. Here the annual pow-wow was held—the last night of the meet—about the camp-fire. The program included original songs and sketches and a number of witty speeches by members and guests.

As in former years a number of well-known writers, artists, and mountain lovers from many parts of Canada and the United States took part in the trip. At the conclusion of the pow-wow the cavalcade disbanded, some going by motor back to Banff or Lake Louise, others taking the secondary ten-day fishing trip along the Clearwater river.



Trail Riders Visit New Scenic Area—Each season greater numbers of tourists are exploring the new scenic wonderlands in the National Parks of Canada by following the trails opened up by Parks engineers. In the above view a party of trail riders are enjoying the beauty of the scenery from the Big Red rock on Blakiston trail in Waterton Lakes National Park, Alberta.

CANADA'S GAME RESOURCES ARE WELL CONSERVED

(Continued from page 1)

game for which they are noted. The eastern portions of Quebec, including the Gaspé peninsula and numerous locations along the St. Lawrence, furnish good sport for ducks, geese, shore birds and other small game as well as a good supply of moose, deer, and bear. The northern and western sections are, however, the popular areas with big game hunters. In Ontario good sport for game birds, small game, and deer may be had close to the settled districts in southern and eastern Ontario. The real big game territory has, however, been fixed by sportsmen as that vast country lying north and west of the French and Mattawa rivers where such game animals as moose, deer, bear, and wolf are found in abundance.

The prairie sections of Manitoba, Saskatchewan, and Alberta are famous for their duck and wild-fowl shooting, while the northern sections are well stocked with moose, mule deer, Virginia deer, caribou, bear, and lesser game.

The western or mountainous portion of Alberta and the entire province of British Columbia offer perhaps a greater variety of game than any other section of America. Here will be found moose, three species of deer (mule, Virginia, or white-tailed, and Columbia black-tailed); several species of caribou; grizzly, brown, and black bear; cougar or mountain lion; elk; mountain sheep; and mountain goat; as well as a large variety of birds, waterfowl, and small game.

The sportsmen who would blaze new trails and see new scenes are more and more turning to the Yukon. Although it takes considerable time for a trip to this territory, the journey may be made in comfort, by boat from Vancouver or Prince Rupert to Skagway, and thence by train over the White Pass and Yukon railway to White Horse, Yukon Territory, from which point travel to the hunting grounds is concluded by pack train, boat, or wagon; everything necessary is provided by the transportation companies and outfitters. In addition to the wealth of game, which includes white, stone, and Fannin sheep, mountain goat, moose, Osborn's caribou, grizzly, brown and black bear, the country has an impelling attraction for the

tourist who delights in exploring the wonders and beauties of nature in a wild and primitive region.

The sportsman planning a hunting trip to any part of Canada need not anticipate any difficulty whatsoever. The entire country is well served by roads, railways, or steamboat lines over which the sportsman will be conveyed in comfort to the "going-in point" at which he may arrange with reliable outfitters to provide for his every need and guidance while on the hunting ground. While each province or district has its own special attractions there is game to be found in every province and the hunter in making a choice of a hunting ground need be governed only by the distance he cares to travel and the particular species of game he prefers to hunt.

The game laws are drafted by the various provincial Governments with a view to meeting local conditions and consequently there is no uniform law for the Dominion as a whole. Hunters should communicate with the game department of the particular province in which they intend to hunt in order that they may be advised regarding the regulations. General information on hunting in Canada will be furnished on application to the Department of the Interior, Ottawa.

WESTERN LAND SETTLEMENT

Homestead Entries and Soldier Grants During July Above Same Period in 1929

Increases in the number of homestead entries and soldier grants made in Western Canada were recorded in July of this year as compared with the same period in 1929 according to figures compiled in the Dominion Lands Administration of the Department of the Interior. The comparative table follows:—

Agency	Homesteads		Soldier Grants	
	1929	1930	1929	1930
Calgary	41	59	3	5
Dauphin	51	84	2	..
Edmonton	433	652	17	30
Grand Prairie	286	452	7	29
Kamloops	7	6	..	..
Lethbridge	18	7	1	..
Moose Jaw	106	75	3	7
New Westminster	4	8	1	5
Peace River	401	468	20	16
Prince Albert	472	734	9	22
Revelstoke	3	5	..	..
Winnipeg	29	51	2	2
	2,001	2,801	65	116

Half-breed Scrip, 1930—2.
Total for July, 1929—2,066; total for July 1930—2,719.

REMARKABLE INDIAN RUINS ARE ACQUIRED

Southwold Earthworks Near St. Thomas, Ontario, to be Set Aside as National Historic Site

Noteworthy results have been achieved by the Department of the Interior in the preservation and restoration of historic buildings, ruins and monuments, and in the erection of cairns and tablets, commemorative of outstanding events and persons associated with the romantic life-story of Canada. Safeguarding and keeping for this and future generations sites of exceptional historic interest is a national obligation, but another value is that which relates to tourist traffic. In this day of good highways and rapid transit by motor, travel is made doubly interesting by landmarks and monuments which call to mind the story of early days.

The National Parks Branch, Department of the Interior, which administers this important work acting on the advice of the Historic Sites and Monuments Board of Canada, recently acquired for national purposes the site of the Southwold Earthworks near St. Thomas, Elgin county, Ontario. This comprises the ruins of a unique double-walled fort erected by the Attiwandaronk or Neutral Nation of Indians, covering an area of about three and one-half acres. The fort proper was protected by a double line of earthworks, by which it was completely enclosed. Between the walls lay a moat thirty feet wide. In all probability the superstructure of the earthworks was a palisade of high, sharpened logs. Canadian archaeologists and officials of the Smithsonian Institute of Washington declare the remains to be those of the only existing double-walled Indian fortification in America.

The Attiwandaronks who occupied the region were expelled by the Iroquois about 1650. Previous to their expulsion they were visited by French traders, but the earthwork has disclosed nothing that would indicate contact with European civilization. Flint arrowheads and bone needles which have been unearthed are of the most primitive type, and point to an age of hundreds of years.

The site of the stronghold is thought to be the place at which the people of the Neutral Nation made their last desperate stand against the fierce Iroquois warriors, by whom they were driven from Ontario. Visitors to the beautiful Lake Erie country following the Montreal-Toronto-London highway, will be impressed by this ancient Indian fortress in western Ontario, situated just north of the Talbot road on the town line between Southwold and Dunwich.

A plaster cast of the double-walled fort, as surveyed by the late A. W. Campbell, C.E., is at present in the archaeological section of the Provincial Museum, Toronto, and is an object of great interest.

Apples in Quebec

There are records to show that in 1663 apples were being produced in the province of Quebec, and it is here that the celebrated Fameuse apple is thought to have originated. The capabilities of this province for the production of apples of the finest appearance and best quality are very great.

NATURAL RESOURCES CANADA

Published by DEPARTMENT OF THE INTERIOR, Ottawa

VOL. 9

OCTOBER, 1930

No. 10

CONSERVING GAME RESOURCES

Two Important Meetings Were Held in Canada During August To Discuss Problems

Game conservation on the North American continent has been the subject of particular attention during the present autumn season. At this time of the year when thousands of sportsmen all over the country are on their way to the great wilderness areas, to enjoy the pleasures of hunting and fishing it seems opportune that the conservation of the immensely valuable resources represented by the furred and feathered denizens of our forests, marshes, and uplands and the finny inhabitants of our lakes and streams should be under discussion.

Two important meetings to deal with ways and means of protecting and increasing the wild life of the continent were recently held in Canada, namely, the biennial conference of Provincial and Dominion Game Officers which met on August 21 and 22 in Ottawa and the annual meeting of the International Association of Game, Fish, and Conservation Commissioners held in Toronto on August 25 and 26. Resolutions embodying practical suggestions for the improvement of game conditions throughout Canada and the United States were adopted, and the large and representative gatherings of delegates at all the meetings indicated the leading place which game conservation is taking throughout the country today.

The meetings at Ottawa, which were attended by representatives from seven of the nine provinces as well as by leading officials of the Dominion departments interested in wild life conservation, were held in the National Museum. Hon. Sir George Perley, acting for the Prime Minister of Canada, welcomed the delegates and in the course of his opening remarks stressed the importance of game protection and conservation, and commented on the great strides which had been taken in this direction during recent years. Through the efforts of game conservationists throughout the country public attention had been called to the value of our wild life and the many dangers which threatened it, with the result that on every hand Dominion and provincial officers had met with the hearty co-operation of sportsmen in the proper enforcement of the game laws.

A number of important resolutions were brought in by the special committee selected by the conference. The meeting was of the opinion that measures should be taken at once to institute and carry on biological surveys for the establishment of preserves and sanctuaries in Northern Canada; that a uniform tag should be adopted

for the shipment of furs passing out of the provinces; that the provincial authorities and the Department of Indian Affairs should consult with a view to providing for the food needs of the Indians without seriously depleting the game resources; that all hunting of migratory birds in Canada should be restricted by both daily and seasonal bag limits, by the prohibition of the use of live decoys, and by plugging pump-



Conserving Game Resources—In the above photograph can be seen large numbers of Canada geese on their seasonal migration rising from Jack Miner's sanctuary at Kingsville, Ontario. Thousands of migratory waterfowl stop here to rest and feed during their journeys north and south.

guns to limit the number of shots which may be fired without reloading; and that the anomalies with respect to interprovincial shipments of game and parts thereof should receive the attention of the Department of Justice for the prevention of evasions and abuses.

The annual meeting of the International Association of Game, Fish, and Conservation Commissioners held in Toronto was attended by delegates from nearly every province of the Dominion, by game officers from many parts of the United States, and by Canadian and United States federal representatives and others interested in game conservation on the continent. The delegates were welcomed by the Hon. Charles McCrear, Minister of Mines and of Game and Fisheries in the Ontario Government, and by Mayor Wemp of the city of Toronto.

A number of papers on different phases of wild life conservation were presented. An outstanding characteristic of the discussion was the evident appreciation of "the other fellow's problems" and a general inclination to co-operate in every way for the advancement of game conservation.

(Continued on page 4)

THE TURNER VALLEY OIL-FIELD

Alberta Area Holds Prominent Place Among Dominion's Producers—A Review of Its Development

With a production of well over a million barrels of petroleum in the fiscal year ending March 31, 1930, the Turner Valley field took its place among the leading producing areas of the Dominion. The events leading up to the discovery of the Turner Valley field give a graphic picture of the courage and perseverance of the pioneers of the industry. For many years after the discovery by travellers in the eighteenth

northern part of the province with the discovery of petroleum as the objective. The first well, "spudded in" on August 15, 1894, struck a stray flow of gas at 245 feet and eventually reached a depth of 1,770 feet but the expected oil in the Devonian rocks was not found. The second well, where the Pelican river joins the Athabaska, struck the gas at 820 feet and heavy tarry oil entered the hole, but for technical reasons no production was possible.

The first gas wells had not been remarkably prolific but around the turn of the century deeper drilling had revealed the existence of the famous Medicine Hat gas sand. Attempts to find production in this over a wide area to the south of Medicine Hat proved it to be water-logged and then, encouraged by the results in the North, still deeper horizons were explored, resulting in the discovery of gas at Bow Island in 1909, from which source the city of Calgary was furnished with gas. This field, having been heavily drawn upon and having in consequence suffered considerable depletion, is now in process of being 're-pressured' by having Turner Valley gas pumped into it. By an Act passed in 1904 a bounty of one and one-half cents per gallon was paid on crude oil produced in Canada and this in conjunction with the hopes of finding oil in the "Dakota," as the formation believed to underlie the prairies was called, was the real incentive to this work.

It is necessary to explain that horizons equivalent to the sands which lie near the surface on the Athabaska in northern Alberta, are only met at relatively greater depth at Medicine Hat or Bow Island, whilst passing westwards they plunge so that the comparatively deep drilling undertaken at Calgary about the same time as that at Bow Island failed to reach even the Medicine Hat gas sand. Yet in the foothills not far west, these same horizons crop out at the surface, in numerous places being accompanied by gas springs and occasionally with oil 'seepages.' A noticeable oil seepage in Cameron brook just north of the international boundary near Waterton lakes actually led to quite an oil boom in 1890, a well being drilled on the Dungarvan creek but to no great depth. In 1902 a fair show of oil was struck in a well drilled near this seepage and even a refinery operated for some time on the product.

A strong gas spring occurred in the bed of the Sheep river, close to the outer edge of the foothills, about thirty miles south of Calgary and here in 1913

(Continued on page 5)

century of the tar sands of the Athabaska river, they were regarded as a natural phenomenon without any apparent economic value, yet it is now realized that at least they must represent a colossal volume of hydrocarbons.

Detailed investigations were carried out by Dr. Robert Bell of the Geological Survey in 1882, and in his report he expressed himself, not only with regard to the importance of the asphaltic material of the "tar sands" but also drew attention to its witness to the possible retention of petroleum as such "in great quantities" and which "may be found by boring." The prospects were pictured as favourable and the principal obstacle to development was recognized to lie in the then lack of markets.

The following year attention was diverted to the accidental strike of inflammable gas in a well drilled by the Canadian Pacific Railway for water at the station on their main line known as Langevin (now Alderson), some thirty miles west of Medicine Hat. The industry which then arose in southern Alberta called attention to the widespread occurrence of natural gas in commercial quantities and resulted in the Government drilling three wells in the

IMPORTANT WORK OF DOMINION FUEL BOARD*

Administers Measures to Promote Use of
Canadian Coals—Progress of
Campaign

Canada's growing independence of imported coals and the expansion of markets for domestic fuels are shown in a recent statement of the Dominion Fuel Board. The Board, which was formed in November, 1922, to aid in relieving conditions as a result of the fuel shortage at that time, has been carrying on a progressive campaign to make better known the suitability of Canadian coals for domestic and industrial consumption and to place them on a better basis in competition with imported coals. In regard to coals from the Maritime Provinces carried by water to St. Lawrence River ports, the Board supervises the further transportation to points where foreign coals are competitive, while in the West the Board is also charged with the administration of the assisted movements of western coals into the Manitoba markets.

That the efforts of the Board are meeting with success is demonstrated by the tonnage figures of the current year. Of Maritime Provinces coals moving to Quebec and Ontario, the Board reports that this year, as at September 15, no less than 552,000 tons of coals were accepted for transportation, while in the West the operative figures are becoming important. Since June 14 last, 110,000 tons of coals have been moved under the assisted freight rates from Saskatchewan, Alberta, and the Crowsnest Pass district of British Columbia for industrial consumption at Winnipeg and other points where foreign coals ordinarily can be sold at a lower price than Canadian coals. It is interesting to note in connection with the promotion of Western Canadian coals as stable industrial fuels that the tonnage so far reported by the Board as accepted for movement to Manitoba is divided among one hundred and thirty separate contracts.

Other legislation which the Fuel Board administers is the Domestic Fuel Act, 1927, which provides assistance for by-product coking plants which use Canadian coals. A plant in the city of Halifax is operating under the provisions of the Act, and at present the Board is applying the Act with reference to a coking plant in Quebec city.

Since its inception, the Fuel Board has been carrying on a thorough study of the Canadian fuel situation. It has conducted exhaustive inquiries on both technical and economic aspects of utilizing Canadian coals to a greater extent and on methods of improved fuel utilization. Two main investigations on which printed reports have been issued relate to central heating and to the commercial feasibility of the establishment of by-product recovery coking plants in Ontario and Quebec. Attention has also been given to house insulation and to the control of humidity in homes during the artificial heating season. Pamphlets on these subjects have been published.

Educational propaganda issued by the Board advocating the use of alternative fuels for United States anthracite has, it is believed, directly resulted in the

* Prepared from material supplied by Dr. Charles Camsell, Chairman of the Dominion Fuel Board, Ottawa.

PATROLLING THE CANADIAN ARCTIC

All Posts Are Reprovisioned and Changes in Personnel Effected—Health of
Natives Good

Posts in the Canadian Arctic archipelago have been reprovisioned, changes in personnel have been effected, and the annual patrol completed for this year. The most adverse weather conditions experienced in years were met with by this season's expedition of the Department of the Interior. From the time the SS. *Beothic* left the Labrador coast for the dash across Davis strait to Godhavn, Greenland, until she again headed down the Labrador coast for the home port of North Sydney, she almost continuously had to fight her way against ice, fog, high winds and heavy seas. In only a very few instances were the supplies landed under favourable conditions, ice and adverse winds making the work very arduous. The re-stocking of the cache at Winter Harbour, Melville island, had also to be abandoned for this year owing to the heavy ice.

The 1930 expedition left North Sydney, Nova Scotia, on July 31 and, after a stormy run, reached Godhavn, Greenland, where a call was made. Proceeding northward the *Beothic* made an unsuccessful attempt to reach Bache Peninsula, and after a five days' battle with the ice it was necessary to land the supplies some miles from the post where they were taken in charge by the members of the Bache Peninsula detachment later to be transported by sled. Heavy ice and high gales were met with during the voyage south to Dundas Harbour which was reached on August 19 and after unloading supplies the ship turned westward on the following day to make the trip into Winter Harbour, Melville island. Ten days were occupied in trying to force a passage to the objective. The attempt had finally to be abandoned for this season and a desperate struggle begun to regain the waters of Baffin bay.

On September 1 the *Beothic* reached Pond Inlet, Baffin island, one of the most important posts in the archipelago. A high northeast gale prevented the expedition from landing supplies until the evening. Good health had prevailed at the post during the year while conditions generally among the natives of the northern part of Baffin island had been satisfactory. Important patrols were carried out by Dr. H. A. Stuart, departmental medical health officer stationed at Pangnirtung, and members of the Pond Inlet detachment of the Royal Canadian Mounted Police.

On the afternoon of September 4 the expedition arrived at Pangnirtung, southwestern Baffin island. During the voyage south from Pond Inlet, the

greatly increased utilization of such fuels in Ontario and Quebec, and has correspondingly reduced the dependence of these provinces on anthracite from across the border.

In connection with its inventory of Canadian fuel resources and supplies and its analyses of the economic aspects of the coal situation, the Board has collected much valuable information. This information is available to the public. The numbers of inquiries received and dealt with by the Board are increasing year by year, and indicate an ever-growing public interest in questions of fuel efficiency and fuel economy.

Beothic called at Clyde River, a trading post and native settlement on the eastern coast of the island. High winds and heavy seas retarded unloading at Pangnirtung and the work had to be put off until the following day. On the afternoon of the 7th the *Beothic* continued her voyage and two days later reached Lake Harbour on Hudson strait. With the exception of an outbreak of influenza, the health of the inhabitants had been good. No cases of influenza had been reported since August 25.

Mr. J. D. Soper, scientific investigator for the North West Territories and Yukon Branch of the Department of the Interior, who with his family is stationed at Lake Harbour for two years making investigations and surveys, met the ship. He went North earlier in the season on board a Hudson's Bay Company's boat and had already completed the construction of a storehouse and the foundations for his residence. The *Beothic* brought additional materials for his home.

At daylight on the eleventh the expedition left Lake Harbour for Chesterfield in Hudson bay which post was reached on the morning of the fourteenth. The unfavourable weather which had greeted the ship at almost every post still persisted and the expedition was held at Chesterfield nearly three days unloading 150 tons of supplies in the face of a stiff northeast wind. Mr. A. E. Persild, investigator for the North West Territories and Yukon Branch, who spent the summer in the country along the Kazan river and around lake Yathkyed making a biological survey to discover its suitability as a reindeer grazing area, and Dr. L. D. Livingstone, departmental health officer, who established a post at Chesterfield this year and who is being relieved by Dr. D. S. Bruce, ship's doctor during the patrol, boarded the *Beothic* at Chesterfield.

The *Beothic* turned east on the last leg of this year's patrol on September 17. On the evening of the next day a stop was made near the east end of Coats island, which is located in the northern part of Hudson bay. This was to allow Mr. Persild to investigate the reindeer grazing possibilities of the island. Coats island is surrounded by open water at all seasons of the year which accounts for the fact that there are no predatory animals on it and none can make their way there. However there are caribou on the island and if it is found suitable for reindeer grazing there is a possibility that a herd will be placed there. This would be in accordance with the recommendation of the Royal Commission upon the Possibilities of the Reindeer and Muskox Industries in the Arctic and Sub-Arctic Regions.

At 5 o'clock on the evening of September 19, the ship again proceeded on her way. The voyage through Hudson strait was made in the face of a northeast gale, fog also hindering the progress of the *Beothic*. On the morning of the 22nd the expedition reached Port Burwell at the eastern end of the strait. Cargo for this point was expeditiously handled and the ship was again under way at daylight on the following day. Rough seas, fog, and high winds

SURVEYS DISPLAY AT NATIONAL EXHIBITION

Ontario Department of Surveys And Topo-
graphical Survey, Department of the
Interior, Co-operate

At the recent Canadian National Exhibition at Toronto an outstanding exhibit was that of the Ontario provincial Department of Surveys and the Topographical Survey of the Department of the Interior. This combined exhibit was housed just within the western entrance of the Province of Ontario Building and attracted, both by its originality and the material displayed, a great deal of interest from the general public.

Over seventy feet of frontage space was devoted to the display of the work of both organizations and the attractiveness of the exhibit was enhanced by a realistic representation, at one end of the booth, of a surveyor's camp in the vicinity of the Manitoba-Ontario interprovincial boundary. The surveyor's tent, set down amid the small spruce trees, together with some of the usual camp accessories, surveyor's instruments, and a replica of his campfire constituted a pleasing feature.

In the carrying out of the plans for the exhibit, co-operation was maintained between the provincial and the Dominion organizations and every effort was made to emphasize the fact that in the actual mapping work in Ontario similar co-operation takes a very active and workable form. By arrangement between Mr. L. V. Rorke, Surveyor General of the Ontario Department of Surveys and Mr. F. H. Peters, Surveyor General of Dominion Lands and Director of the Topographical Survey of the Department of the Interior, members of the staffs of both organizations were in constant attendance to explain the various features of the work and to give out information regarding the issue of maps and the mapping work in general.

ALBERTA'S OIL PRODUCTION

Comparative figures of oil production in Alberta during July, 1930, and the same period last year indicate the rapid growth of the industry in western Canada. The table which was compiled in the Department of the Interior from the reports of operators shows that the total production in July, 1930, was 112,181 barrels, which was an increase of 1,572 barrels over June of this year, and 14,736 barrels above the month of July last year.

The Turner Valley field has, as heretofore, produced all the naphtha (100,278 barrels) and also 3,607 barrels of light crude. The Red Coulee field output consisted of 6,226 barrels of light crude; Wainwright, 758 barrels of heavy crude; Ribstone, 234 barrels of heavy crude; and Skiff, 1,078 barrels of heavy crude.

The comparative table follows:

	Naphtha	Light Crude	Heavy Crude	Total
	Barrels	Barrels	Barrels	Barrels
July, 1930.	100,278	9,833	2,070	112,181
July, 1929.	92,626	3,389	1,430	97,445

were encountered on the trip down the Labrador coast but the ship reached the home port of North Sydney safely on the evening of September 27.

NATURAL RESOURCES CANADA

PUBLISHED BY

THE DEPARTMENT OF THE
INTERIORHON. THOMAS G. MURPHY,
MinisterW. W. CORY, C.M.G.,
Deputy Minister

Natural Resources, Canada, is published monthly for the purpose of promoting interest and supplying information respecting Canada's natural resources and their development. Inquiries respecting any matter or document dealt with should be addressed to

The Secretary,
Department of the Interior,
Ottawa.

This bulletin is also issued in French.
Articles may be reproduced with or without credit.

OTTAWA, OCTOBER, 1930

MAKING TOPOGRAPHIC MAPS OF THE DOMINION

Important Work of Topographic Survey of
the Department of the Interior

When the map maker undertakes to produce a topographical map of any region, namely, a map showing all the natural and artificial features of the region compatible with the scale employed (including also elevations, generally by the use of contours), one of his first considerations is the question of control. By this control, he, as it were, "pins down" the corners of his map upon the earth's surface giving it its proper location and he also lays down the skeleton framework upon which the topographic detail can be placed accurately and without confusion.

If the area of the map sheet is already embraced within the system of geodetic control as laid down by the Geodetic Survey of Canada, the work of laying down the more detailed mapping control is thereby greatly expedited. The mapping control may consist of a network of connected lines, the lengths and directions of which have been accurately determined, by chained traverses, which serve to divide up the area to be mapped into smaller portions. With such a network laid down over the area to be mapped, it is possible to fill in the topographic detail secured by aerial or plane-table methods correctly. Mathematical examination of the distances and bearings of the various lines whether triangulation or traverse lines which go toward making up this control system enables the surveyor and mapper to test his work for accuracy and completeness. As a matter of fact, the entire work is one where mathematical precision has a very important place.

In some parts of the country it is possible to use pre-existing surveys as control for topographic maps, but it is generally necessary to have a good deal of additional work done in checking and connecting such surveys or in making supplementary surveys to complete the required control.

Of course, in the matter of laying down mapping control there is nothing to prevent the surveyor and mapper making use, on any particular map sheet, of any combination of the above methods or even of any alterations or amendments. The surveyor and map-

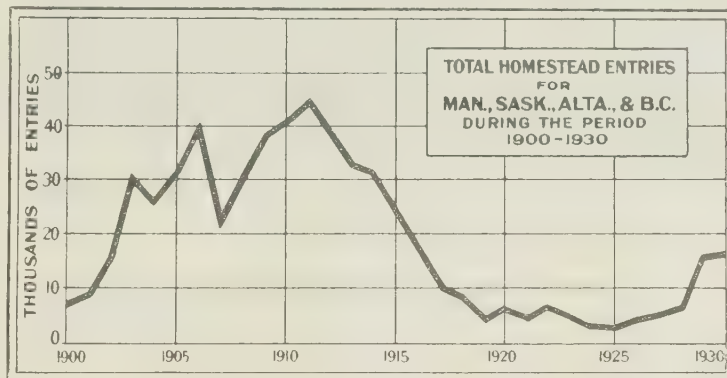
HOMESTEAD ENTRIES IN WESTERN CANADA 1900-1930

The present year terminates the administration by the Dominion Government of the lands and other resources of the three Prairie Provinces, and of the areas in British Columbia known as the Peace River Block and the Railway Belt. These resources now pass under provincial control.

One of the notable changes involved is that the historic Dominion home-

ness may be judged from the fact that the entries represent, at 160 acres each, nearly 100,000,000 acres of land.

As the accompanying diagram shows, homestead activity reached its peak in the three or four years immediately preceding the War. While the last two years have brought a decided spurt in the number of entries, the post-War



stead policy now gives way to such land policies as may be framed by the several provinces concerned. For nearly sixty years the homestead system has played a cardinal role in the disposal of what have been known as "Dominion lands", and in the advance of Canadian development. Since 1900 nearly 600,000 homestead entries have been made, and while many of these were never completed the magnitude of this land busi-

ness, generally speaking, has witnessed only a moderate degree of homesteading activity. The rise and fall of homestead entries illustrates perhaps better than anything else the fact that in more recent times the granting of homesteads has not been the all-absorbing task for the Department of the Interior that it was fifteen or twenty years ago.

per must, of necessity, size up the situation before him when he wishes to produce his map and give due consideration to all questions of economy and expediency, in working out his method of procedure.

In the northern parts of Canada, which are practically unexplored, the Topographical Survey of the Department of the Interior is producing four-mile to the inch map sheets of the National Topographic series by aerial photographic methods which present unusual problems of mapping control.

Such a map covers an area of approximately 6,000 square miles. Frequently there are no lines of previous surveys within it and not one point of which the geographical position is accurately known. Wherever practicable traverse lines are carried into and through the area of the map sheet, but, owing to the extent of forest cover, it is generally necessary to arrange that such traverses be made by stadia measurements along the shore lines of rivers and lakes. Stadia traverses are, of course, only a secondary form of control and in order to ensure that their errors be kept within reasonable limits precise determinations of latitude and longitude are made at various points along them.

The maps produced from such secondary control are issued as "provisional" maps, pending further development of the areas shown on them. When that time arrives, more precise surveys will be made and more accurate maps produced from them.

In the meantime these "provisional" maps are substantially correct within the limits of a four-mile-to-the-inch scale and fulfil every possible requirement of foresters, water-power engineers, mining prospectors, and scientific explorers.

Northern Wild Flowers

Many varieties of wild flowers grow in great profusion throughout the treeless plains of Northern Canada.

WESTERN LAND SETTLEMENT

Homestead entries and soldier grants made in the provinces of Saskatchewan and Alberta during the month of August totalled 1,213 according to figures compiled in the Dominion Lands Administration, Department of the Interior. As the province of Manitoba took over the administration of her natural resources on July 15 and British Columbia on August 1, there are no figures available for these two provinces.

The table follows:

	Homesteads		Soldier Grants	
	1929	1930	1929	1930
Calgary..	37	34	1	2
Edmonton..	445	420	15	11
Grande Prairie..	176	116	8	2
Lethbridge..	11	9	....	....
Moose Jaw..	78	30	4	1
Peace River..	217	258	14	17
Prince Albert..	443	302	13	10
	1,407	1,169	55	43

THE TURNER VALLEY OIL-FIELD

(Continued from page 1)

drilling began. On October 6 of that year in the Calgary Petroleum Products' well No. 1 at a depth of 1,556 feet, a remarkable light oil was struck in the long sought "Dakota." The "show" was cased off, the hole deepened and a more prolific source was struck the following May, this precipitating the Calgary "oil boom" of 1914. Owing to a variety of technical and other causes, but mainly to the War, further developments in this area, now known as Turner Valley, languished till September, 1922, when the hole destined to become famous two years later as Royalite No. 4 was "spudded in."

This well reached limestone beneath the formations hitherto explored in Turner Valley and in this at a depth of 3,740 feet struck a flow of wet gas amounting to 21,500,000 cubic feet per day, from which eventually over 600 barrels of naphtha per day was obtained. The subsequent booms of 1926

YELLOW BIRCH LEADS CANADIAN HARDWOODS

More Than One-Third of Production Comes
From This Species—Has Many Uses

The yellow birch (*Betula lutea*) is commercially the most important hardwood in Canada, forming more than one-third of the hardwood lumber produced in this country. For a long time lumbermen looked upon it as a "weed" tree largely because of the difficulties of transport. It cannot be floated long distances down stream as readily as can the conifers or softwood species with which it is associated in the forest. However, as other timber is becoming more scarce, operators in the woods are beginning to take more interest in yellow birch and its excellent and outstanding qualities are becoming better known.

The yellow birch is the largest of several species of birch found in Canada, and sometimes reaches a height of ninety to one hundred feet, and a diameter of forty or more inches. It is known by several names, such as sweet birch, cherry birch, and black birch. The most common name, yellow birch is derived from the colour of its bark which is straw-coloured or yellowish and tattered in appearance, being composed of thin, curly strips which hang loosely from the trunk.

The heartwood of the yellow birch is usually reddish-brown in colour, while the sapwood is nearly white. The wood possesses many of the best and most useful qualities of the hardwood trees. It is susceptible of high polish and retains stain readily, and, therefore, is a favourite wood for wooden novelties of all kinds, furniture, spools, and handles.

The wood wears well, and is consequently used to make pulleys, reels, toys, etc. It is frequently treated to resemble mahogany, walnut, and similar expensive woods, and because of its strength and elasticity, it is used for vehicles, automobile bodies, wheel hubs, trunks, and agricultural implements. Yellow birch is also an ideal wood for flooring on account of its smoothness, hardness, strength, and wearing qualities. Its tendency to decay, has discouraged the use to any extent of yellow birch for outside structures, but for all kinds of interior house finish, it is extensively utilized.

The yellow birch is essentially an eastern tree, being found in the Maritime Provinces and westward to the lake of the Woods in Ontario. Some eighty-six million board feet of lumber were manufactured from it in 1923, of which over thirty-eight million feet were produced in Quebec, and twenty-four million feet in Ontario. The remainder was cut in the Maritime Provinces. In Quebec it is the most important hardwood, while in Ontario it ranks second to maple. Although the yellow birch in our Canadian forests is not yet being utilized to full advantage, appreciation of this truly fine tree is growing steadily, and there is little doubt that it is destined to take an even greater part in the development of the hardwood industries of Eastern Canada.

and 1929 are too recent to call for mention. During the fiscal year ended March 31, 1930, Turner Valley produced 1,109,220 barrels of naphtha and light crude and over a billion and a quarter cubic feet of gas was utilized.

IMPROVE FACILITIES FOR INDIAN EDUCATION*

Department of Indian Affairs Opens New
Residential School at Brandon,
Manitoba

Great advancement has been made in Canada, particularly of late years, in providing our Indian population with a high standard of educational and vocational training. Through the aid of increased appropriations by Parliament during that time, the Department of Indian Affairs has been enabled to enlarge existing buildings, and construct more modern and fireproof schools, whilst higher salaries and grants have attracted better qualified teachers and instructors.

There are now 78 residential schools and 272 day schools, making a total of 350 centres of Indian educational activity. The total number of pupils is now 15,743, the average attendance being 11,579, constituting an increase during the past ten years of 28 per cent in enrolment, and 48 per cent in attendance, ample evidence of the success of the work in preparing Indian children to become independent and self-supporting citizens of the Dominion.

The residential schools are conducted by the Anglican, Roman Catholic, Presbyterian, and United churches, and high tribute must be paid to the zeal and self-sacrifice of those engaged in the work. The Department has had the close co-operation of religious denominations in the education of the Indians, and this well-established policy has demonstrated beyond all question of doubt the effectiveness of the system.

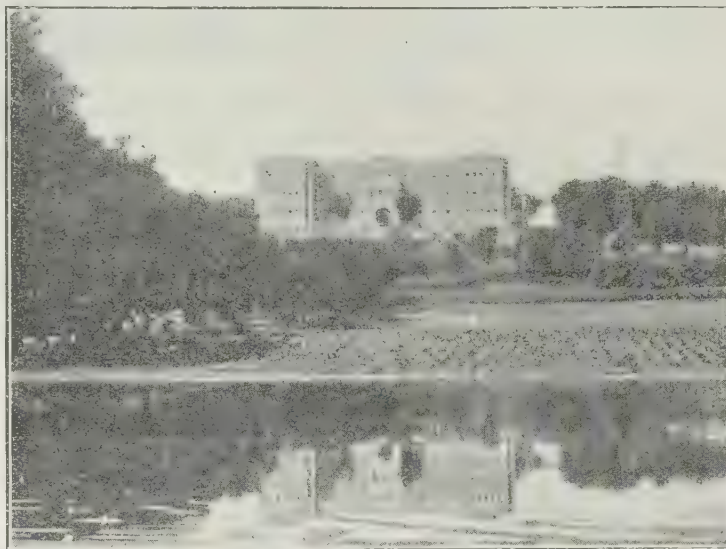
The formal opening of the modern residential school at Brandon, Manitoba, on July 18, 1930, adds another unit to the fine system of Indian educational institutions throughout the Dominion. It will be administered by the United Church of Canada and will have as its principal the Reverend J. A. Doyle, D.D., who succeeds the veteran educationist the Reverend Thompson Ferrier.

This school, which replaces the residential school built on the same site in 1894, is one of the finest of its kind in Canada. Built of tapestry brick with trim of Manitoba limestone, and terrazzo floors, it is fireproof throughout. Some idea of the accommodation afforded may be gleaned from the fact that it has a fine large assembly hall, four dormitories, four class-rooms, a large study room, recreation rooms for both girls and boys, sewing room, sun-room, hospital ward with nurses' quarters, also a laundry equipped with the most modern hygienic appliances.

Adjacent to the school are a number of first-class farm buildings, one of which, the cow-barn, is one of the finest in Manitoba. There are, also, four residences for the use of the principal and married members of the staff.

The institution has a landscape setting, which places it on a par with some of the finest schools and colleges of the older provinces. Brandon city is situated on the south slope of the Assiniboine valley. The Indian school is on the north side of the valley, three miles northwest of the city and is be-

*Prepared at the direction of Dr. Duncan C. Scott, Deputy Superintendent General of Indian Affairs, by Russell T. Ferrier, Superintendent of Indian Education.



Improve Facilities for Indian Education—View of the new residential school near Brandon, Manitoba, recently completed by the Department of Indian Affairs. There is accommodation for 160 pupils, in addition to the teaching staff.

tween the Golf Club and the Dominion Experimental Farm. To the east, on the same ridge, is a large provincial hospital.

This school draws its pupils from a wide radius, owing to the scattered location of the reserves. Residential schools are required because many of the Indians are engaged in occupations such as lumbering, fishing, freighting, and trapping, which take them away from their homes; and even the farms of those engaged in agriculture are not in solid blocks, as in white settlements, but are strung out along rivers and lakes, thus making it impossible to provide day-school accommodation for the major portion of them.

The curriculum provides academic instruction equivalent to the second year in high school. In addition the girls are given a thorough training in domestic science, and the boys, a course in agriculture, together with elementary training in carpentry, blacksmithing, and the operation of internal combustion engines, sufficient to enable them to apply it in a practical manner in modern farm life.

While every possible effort is made to impart a sound academic and industrial education, special attention is given to the health of the pupils. During the years spent in the residential schools medical treatment is provided, which, with a balanced diet, and supervised recreation, assists in the building up of a robust constitution.

Under the care and tutelage of the Department of Indian Affairs the prairie Indian has now become a successful agriculturist. The official records for 1928 show that 65,104 acres, in the Prairie Provinces alone, were sown to grain, from which were garnered 65,104 bushels. In addition, 971 acres were planted to root crops from which 61,448 bushels were harvested; and 87,766 tons of hay and other fodder were produced.

CONSERVING GAME RESOURCES

(Continued from page 1)

Resolutions were passed favouring more nearly uniform and more restricted hunting seasons, bag limits, and methods of hunting migratory birds. The meeting also went on record as favouring the Canadian practice of holding regular gatherings of federal and provincial game officials and recommended that similar meetings be held in the United States by state and federal conservation officers.

COLLECTING TREE SEEDS FOR PRAIRIE PLANTING

Children of Dauphin, Manitoba, Aid in Work—
Gather Millions of Seeds

As a result of the efforts of the boys and girls of Dauphin, Manitoba, there will probably be several million new trees sprouting on Canada's western prairies next year. Again this year, as in many years past, the school children are helping Mr. F. J. Smith, Supervisor of the Riding Mountain Forest, to collect seeds from the Manitoba maple trees in the vicinity of Dauphin. After collection, the seeds are shipped to the Forest Nursery Station of the Department of the Interior at Indian Head, Saskatchewan, where they are planted in seed beds to germinate. The seeds may be planted either in the autumn or the following spring and the next spring following, when they have been in the seed bed eighteen or twelve months, as the case may be, the young seedlings are lifted and set out in the permanent plantation.

The seeds collected by the Dauphin children filled 139 sacks. This figure does not seem large, and even 3,058 pounds (a ton and a half) is a reasonable quantity to grasp, but when it is considered that a pound of Manitoba maple seed on an average contains 13,000 tree seeds, the number of seeds in this collection reaches the astounding total of 39,754,000. Of course, many of these will not germinate and of those that do, a proportion will die without having reached maturity. Nevertheless, it is a conservative estimate that as a result of the children's efforts over twenty million more maples will eventually help to beautify many farm homes in Manitoba, Saskatchewan, and Alberta.

Wollaston Lake Has Two Outlets

An interesting feature about Wollaston lake, shown on the map as covering about 1,000 square miles of Fond-du-lac River basin in northern Saskatchewan published by the Topographical Survey, Department of the Interior, is that it has two large outlets. These are Fond-du-lac river draining to lake Athabaska and thence to the Arctic ocean, and Cochrane river flowing to Reindeer lake and through Reindeer and Churchill rivers to Hudson bay.

IMPORTANT ADVANCE IN ASTRONOMIC KNOWLEDGE

Results of Study by Dominion Astrophysical
Observatory of Diffuse Gaseous Matter
in Stellar System

The presence of very tenuous gases in the space between the stars, previously indicated and discussed by others, was definitely proved at the Dominion Astrophysical Observatory at Victoria, B.C. about seven years ago. It was then shown that stars of the highest temperature from 30,000 to 50,000 degrees Fahrenheit, of the greatest mass up to about 100 times that of the sun, and of an intrinsic brightness over a thousand times greater than the sun, were rushing about rapidly in all directions through diffuse gases which were nearly stationary in the stellar system. The gaseous matter which is believed to be of the same general composition as the earth, was recognized by the appearance of certain lines in the spectra of these hot stars and was shown to be widely extended throughout the system.

About four years ago Sir Arthur Eddington was led, by the proof at Victoria that the hot stars were in rapid motion through nearly stationary gases, to investigate theoretically the physical properties of this gaseous matter. He was able to show that it must be almost unbelievably tenuous, of thousands of times higher vacuum than an incandescent lamp. Indeed the whole volume of the earth would contain only about a quarter of a pound of such gases. He showed further that these gases behaved in an almost paradoxical way, that although external space was so cold that a solid body placed in it would fall to about 450 degrees below zero Fahrenheit, the molecules of these diffuse gases were so far apart, about one in every cubic centimetre, that the radiation from all the stars would give speeds to these molecules corresponding to a temperature of about 20,000 degrees. Eddington assumed these rare gases were uniformly distributed in the space between the stars but there was no proof of this uniform distribution nor knowledge of the motions.

While the early observations at Victoria furnished the foundation from which Eddington deduced the physical properties of this gaseous matter, the final observational completion of the whole structure has just been provided at Victoria where it has been definitely proved that this diffuse gaseous matter is uniformly distributed throughout the stellar system. It has also been shown that this matter is not at rest as previously supposed but partakes in the most beautifully exact way in the orderly and majestic rotation of the stellar system around a very distant centre, the most convincing proof of the similar rotation of the stars having also been obtained at Victoria.

The demonstration that the space between the stars contains very diffuse gases, the theoretical determination of its density and temperature, and the final proof of its uniform distribution and its participation in the rotation of the galaxy, form a striking example of the effective combination of theory and practice. The development of this interesting advance in our knowledge of the cosmos may justly be considered as one of the romances of astronomy and forms an important Canadian contribution to science.

NATURAL RESOURCES CANADA

Published by DEPARTMENT OF THE INTERIOR, Ottawa

VOL. 9

NOVEMBER, 1930

No. 11

1930 SEASON ONE OF GREAT ACTIVITY IN CANADA'S ARCTIC REGION

ADD TO KNOWLEDGE OF OUR NORTHERN COAST

Nearly 2,000 Miles of Coastline Photographed During Investigatory Flight
—Franklin Relics Found

Further valuable information concerning the Canadian Arctic has been obtained by Major L. T. Burwash, investigator for the North West Territories and Yukon Branch of the Department of the Interior, who recently returned from his latest investigation of a wide stretch of territory along the Western Arctic coast extending from Coronation gulf to Boothia peninsula. Nearly two thousand miles of coastline, which up to that time had been but poorly charted, have been photographed, and important facts have been secured with regard to the topography, geology, and mineral development of the country lying between Coronation gulf and Great Bear lake.

With reference to the document known as the "Jamme report" which stated that the graves of Sir John Franklin and others of his party were to be found in the Victory Point area, King William island, Major Burwash, after a careful search of the terrain in question, states in his report to the Minister of the Interior that he could find no evidence in confirmation of the statement, but at the same time he discovered further traces of the unfortunate explorers and brought back with him several relics and a remarkable series of photographs of the country which was the scene of the last march of the ill-fated 105 members of the crews of the *Erebus* and the *Terror* who after the ships became ice-bound attempted to find a way overland to civilization.

Major Burwash left Fort Smith in June last accompanied by Mr. Richard Finnie, also of the North West Territories and Yukon Branch. He journeyed north by boat to Norman, which is situated at the confluence of the Great Bear and Mackenzie rivers. Mr. Finnie proceeded on to Aklavik and Herschel, and thence eastward to the mouth of the Coppermine river, Cambridge Bay, and on to Petersen Bay which is situated on the southeast side of King William island. He joined the aerial party at Petersen Bay. From Norman Major Burwash made the trip to the mouth of the Coppermine by aeroplane, with a short stop en route at Hunter bay, at the eastern side of Great Bear lake, which enabled him to make an examination of copper outcroppings which are now attracting a very considerable amount of interest. Major Burwash reports that discoveries

(Continued on page 3)

PATROL SHIP COMPLETES SUCCESSFUL VOYAGE

SS. "Beothic" with Department of the Interior's Expedition Aboard Had Eventful Trip to Posts in Eastern Arctic

The Department of the Interior has recorded another successful patrol to the posts in the Canadian Arctic archipelago. With the return of the ss. *Beothic* on September 27, this year's expedition completed a 9,000-mile voyage during which all the posts were

personnel included Captain E. Falk, Master, and Captain J. D. Morin, Ice Pilot, and forty-four officers and men. Mr. George P. Mackenzie was again the Officer in Charge of the expedition, the other members being Dr. D. S. Bruce, Ship's Doctor; Mr. J. P. Richards, Sec-



Canada's Arctic Regions—A group of Eskimo women and children pose for the camera at Pond Inlet, Baffin island, during the annual visit of the Department of the Interior's expedition. The ss. *Beothic* which made this year's patrol is seen in the background. The neat, healthy, and happy appearance of this group indicates the generally satisfactory condition of the natives of Baffin island.

re-provisioned, relief personnel was landed at the various detachments, and considerable other work accomplished. The *Beothic* left North Sydney, Nova Scotia on July 31 and during the fifty-nine-day trip calls were made at Godhavn, Greenland; and at the Canadian posts of Bache Peninsula, Ellesmere island; Dundas Harbour, Devon island; Pond Inlet, Clyde River, Pangnirtung, and Lake Harbour, Baffin island; Chesterfield, and Coats island, Hudson bay; and Port Burwell, Hudson strait.

The *Beothic* was more heavily laden during this year's voyage than on any of her four previous trips north for the North West Territories and Yukon Branch. Including the crew there were sixty-nine persons on board. The ship's

retary; Inspector A. H. Joy, of the Royal Canadian Mounted Police and eleven non-commissioned officers and men; and Messrs. A. Y. Jackson and Lawren Harris, artists. Dr. M. Porsild, of the Danish Scientific Station at Godhavn, Greenland, and his grand-daughter, and Messrs. Carlson and Demorest, of the University of Michigan, were carried to Godhavn. Dr. Peter Heinbecker, of St. Louis, who is engaged in a study of the blood groups of the Eskimos, made the complete voyage. Additional quarters had been provided on the ship so that satisfactory accommodation was available for the large number of persons on board.

The cargo was also a heavy one. Four motor boats and 120 barrels of gaso-

(Continued on page 2)

HEALTH OF ESKIMOS IS BEING SAFEGUARDED

Dr. L. D. Livingstone Established New Medical Post at Chesterfield For Department of the Interior

Dr. L. D. Livingstone, Chief Medical Health Officer for the North West Territories and Yukon Branch of the Department of the Interior, recently returned from the North on board the patrol ship, *Beothic*. Dr. Livingstone boarded the ship at Chesterfield where he had been since the beginning of the year establishing a medical post for the benefit of the natives and white men of the region. He was succeeded by Dr. D. S. Bruce, who will remain at this point for the next two years.

The immense value of the medical posts maintained in the North by the Department of the Interior is illustrated by the number of cases attended by Dr. Livingstone during his four months at Chesterfield. Dr. Livingstone left Ottawa for the Hudson Bay point early in the year and travelled by rail to Churchill, making the latter part of his journey from the Pas to the terminus of the Hudson Bay railway in twenty-seven hours. He reached Churchill on April 12 and was held at that point by extremely cold weather and a gale until the 20th when he began the 450-mile journey by dog-team northward along the west coast of Hudson bay.

During this trip Dr. Livingstone visited native settlements at Nunulla, at a point some distance inland on the Tha-anne river, at Eskimo Point, at Mistake Bay, and at Tavane. In all about twenty-five families were visited, representing about 100 natives. This is about one-third of the estimated Eskimo population of the coast, the majority of the natives having not returned from their inland camps. At Chesterfield the native population numbers about 150, while the number of white men seldom exceeds twelve or fifteen. These latter include Government officials such as the wireless operators, the Royal Canadian Mounted Police detachment, and the medical officer; those in charge of the trading posts; the missionaries; and transient mining men.

Immediately upon his arrival Dr. Livingstone proceeded with the work on his dwelling and surgery, the construction of which had been begun the previous autumn. It was completed before he left Chesterfield early in September. A severe epidemic of influenza, which broke out shortly after the arrival of the first ship, spread

(Continued on page 3)



Exploratory and Administrative Patrols in Northern Canada During 1930—On the above map are shown the approximate routes followed by Dominion Government officers in the carrying out of investigations, inspections, and patrols in the Arctic regions of Canada. In the eastern portion are shown the route followed by the annual expedition on board the ss. *Beothic*, Mr. George P. Mackenzie in charge, which covered approximately 9,000 miles; Dr. H. A. Stuart's trip from Pangnirtung, Baffin island to Pond Inlet; also patrols

by members of the Bache Peninsula, Dundas Harbour, Pond Inlet, Pangnirtung, Lake Harbour, Port Burwell, and Chesterfield detachments of the Royal Canadian Mounted Police. In the western part investigations were carried on by Major L. T. Burwash, Mr. A. E. Porsild, Mr. W. H. B. Hoare, Dr. L. D. Livingstone, Mr. Richard Finnie, an inspection trip by Mr. J. F. Moran, and the usual routine patrols by the R.C.M.P. detachments.

PATROL SHIP COMPLETES SUCCESSFUL VOYAGE

(Continued from page 1)

lene and oil for their operation were taken north for the use of the police. Two of these, the *Lady Borden* and the *Lady Willingdon*, were 45-foot launches, while the other two were surf-boats equipped with engines. The launches were left at Pangnirtung and Chesterfield, respectively, and the surf-boats at Bache Peninsula and Baker Lake. Materials for the erection of Mr. J. D. Soper's dwelling at Lake Harbour and for a building at Pangnirtung were also carried as was 200 tons of coal for the Department of Marine's ship, *Acadia*. This was all in addition to the usual supplies for the re-provisioning and re-fuelling of the various posts.

Unusual weather conditions in the North made the 1930 patrol one of the most eventful in the history of the work. Evidences of a particularly mild winter during 1929-30 was found in the fact that the much-dreaded ice-pack in Baffin bay was not encountered. During the voyage from North Sydney to Etah, North Greenland, and again during the southern part of the trip from Pond Inlet to Chesterfield, no field ice was met with. Bergs were numerous as usual but the immense pans of ice which are a matter of much concern to

northern navigators were not met with in these areas during this year's voyage. However, prevailing easterly winds prevented a large part of the ice from moving out of the narrow channels to the north and west. The trip through Smith sound and Buchanan bay to Bache Peninsula, Ellesmere island, was most difficult on this account, while the attempted voyage to Winter Harbour, Melville island, was a fight all the way.

The battle with the ice in Buchanan bay was in many respects only a preliminary to the trying hours during a storm while crossing from the entrance to Smith sound to Dundas Harbour, Devon island. With every wave breaking over the ship during the storm the heavy deck cargo became a matter of deep concern. The terrific power of the great waves as they swept across the deck loosened the lashings on the barrels of gasoline and oil and the deck was soon a scene of wildly tossing casks, each weighing about 300 pounds. The ship was hove to while all hands turned out in an effort to control the careening casks. During this squall Constable Currie suffered a dislocated shoulder in preventing himself from being swept overboard.

The voyage westward from Dundas Harbour, Devon island, through Lancaster sound in an effort to re-provision

the cache at Winter Harbour, Melville island, was probably the most trying of the entire patrol. Old ice, piled high with the winter's snow showing little or no effect of the spring thaw, was being held in huge pans in the channels with the result that the *Beothic* had to fight her way for the approximately 1,200-mile trip through the heart of the archipelago. It was when the ship was faced with an impenetrable barrier of ice consisting of a pan 15 miles in extent that the decision was reached to abandon the attempt to reach Melville island for this year. The trip back to the east was in many respects as hazardous as the voyage to the west.

Conditions among the Eskimos were in the main satisfactory. With the exception of two outbreaks of influenza, one at Lake Harbour during which eight natives died and a rather more serious occurrence along the west coast of Hudson bay during which ten Eskimo succumbed, the health of the natives was comparatively good. Dr. H. A. Stuart, medical health officer stationed at Pangnirtung, Baffin island, made a spring patrol from that point 1,000 miles northward along the coast to Pond Inlet, where he was picked up by the *Beothic* and brought south to his headquarters. The native settlements visited were in a prosperous condition. The fur catch had been exceptionally good, fish

and seals were plentiful, and the members of the various communities were in a healthy condition. Patrols made by the Royal Canadian Mounted Police indicated similar conditions in the other parts of Baffin island visited.

ALBERTA OIL PRODUCTION REACHES HIGH MARK

August Output Sets New Record—Comparative Figures for Same Period Last Year

The production of oil in Alberta during the month of August, 1930, was the highest on record according to figures compiled in the Department of the Interior from the reports of operators. The total output for the month reached 125,725 barrels, which was an increase of over 25,000 barrels over the same period last year. The production from the various fields was as follows: Red Coulee, 6,423 barrels, light crude; Wainwright, 718 barrels, heavy crude; Skiff, 619 barrels, heavy crude; Turner Valley, 115,369 barrels, naphtha and 2,596 barrels, light crude.

The comparative table for August, 1930, and the same month last year follows:

	Light Naphtha	Heavy Crude	Crude	Total
	Barrels	Barrels	Barrels	Barrels
1930.	115,369	9,019	1,337	125,725
1929.	94,685	4,550	1,424	100,659

NATURAL RESOURCES CANADA

PUBLISHED BY

THE DEPARTMENT OF THE
INTERIORHON. THOMAS G. MURPHY,
MinisterW. W. CORY, C.M.G.,
Deputy Minister

Natural Resources, Canada, is published monthly for the purpose of promoting interest and supplying information respecting Canada's natural resources and their development. Inquiries respecting any matter or document dealt with should be addressed to

The Secretary,
Department of the Interior,
Ottawa.

This bulletin is also issued in French.
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OTTAWA, NOVEMBER, 1930

SATISFACTORY CONDITIONS IN MACKENZIE VALLEY

Chief Inspector J. F. Moran Visited Settlements Along Great Northern Waterway

Generally satisfactory conditions exist in the settlements along the Mackenzie river in the Northwest Territories according to Mr. J. F. Moran, Chief Inspector for the North West Territories and Yukon Branch of the Department of the Interior who recently returned from his fifth biennial trip to the posts in the Western Arctic. Beginning at Fort Smith early in the summer, Mr. Moran visited the posts at Resolution, Hay River, Providence, Simpson, Wrigley, Norman, Good Hope, Arctic Red River, McPherson and Aklavik in the Northwest Territories, and Shingle Point and Herschel in Yukon Territory. Health conditions were good, there being no serious outbreaks during the year. On the whole the fur catch was good, with some remarkably large catches in certain parts of the territories.

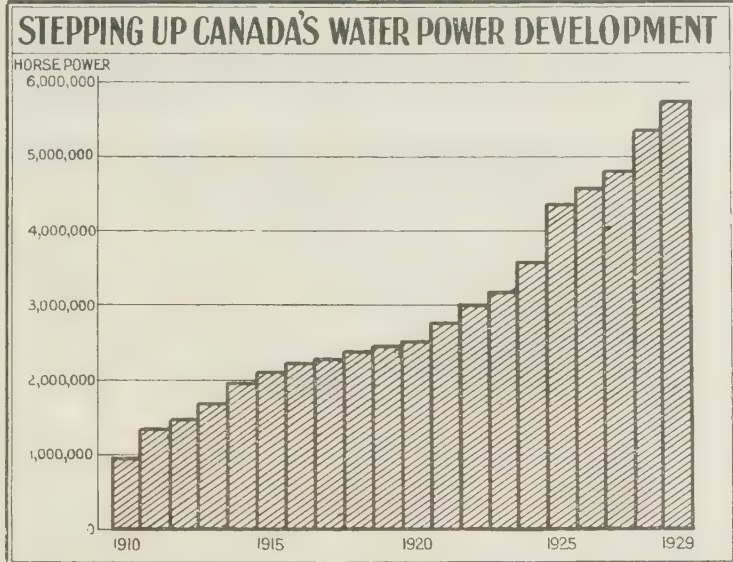
One of the outstanding developments in the North is the progress being made in aerial transportation. With the inauguration this year of the air mail service to the Arctic coast and the extension of transport facilities by the three companies operating in the Northwest Territories, this mode of travel has gone forward rapidly. Three mining companies engaged in prospecting and development work have their own respective fleets of planes for the purpose of moving prospectors and supplies to their different fields of operation. The Royal Canadian Air Force is playing an increasingly important part in the North in aerial surveying and the transportation of government officials and supplies. Consequently the plane has become a common means of travel and transport and in one day as many as twelve planes were seen at one of the posts along the Mackenzie River system.

Mr. Moran left for the North about the middle of May and his trip down the Mackenzie was made in the new hospital ship, *Medico*, constructed for the use of the Department's medical health officer, Dr. J. A. Urquhart, stationed at Aklavik. This craft, which is thirty-eight feet long is

PROGRESS OF WATER-POWER DEVELOPMENT

In taking stock of Canada's position during the present period of world-wide economic difficulty, one of the most inspiring features is the fact that the Dominion's water-power resources furnish a seemingly irrepressible impetus to national progress. In the face of all the buffets of business cycles, water-power development continues to forge rapidly ahead.

Since 1910 Canada's water-power installation has risen from less than 1,000,000 to nearly 6,000,000 horse-power. The record of growth has been a marvel of persistency. During the past twenty years, water-power development



has maintained a sureness of advance through all obstacles—through the pre-war slump, through the disruption of the war itself, and through the drastic ups and downs of the last decade. And today, in the midst of world-wide depression, there is being carried forward the greatest program of hydro-electric installation in the history of the Dominion.

This ability of water-power development to hold its forward course in the face of recession in almost every other major field is one of the most fortunate and favourable factors affecting Canada's economic position and progress.

HEALTH OF ESKIMOS IS BEING SAFEGUARDED

(Continued from page 1)

along the Hudson Bay coast from as far south as Churchill to as far north as Southampton island. Fortunately the outbreak reached its peak at Chesterfield during the fine weather in July and that period of warm, dry days was an important factor in the low death rate. Reports received by Dr. Livingstone up until the time of his departure

showed that ten natives had died. Two of these deaths occurred in Chesterfield while the others were reported from Mistake Bay, Eskimo Point, Baker Lake, and Southampton island.

Apart from the influenza outbreak the health of the natives was comparatively good. A number of minor surgical cases were attended and other treatment given. For the first time during his long service in the North Dr. Livingstone was able to have blood specimens transported south for tests. The two seaplanes of the Royal Canadian Air Force which had been engaged in aerial photographic work in the North this summer landed at Chesterfield on September 7 while Dr. Livingstone was preparing for the arrival of the patrol ship *Beothic*. Flight-Lieutenant F. J. Mawdesley, in charge of the aerial party, undertook to transport the blood specimens to Winnipeg. This had never before been possible as the time required to bring such specimens south was too great and their usefulness for the purpose for which they were required was lost.

The fur catch of the natives along the western coast of Hudson bay was good during the past winter and living conditions were consequently satisfactory. Work on the new hospital being erected by the Roman Catholic mission at Chesterfield was well advanced during this season and with the arrival of the interior fittings next spring the hospital will be ready for occupation in the summer of 1931.

A goodly number of water-fowl areas have been reserved as sanctuaries in the western provinces where so many of Canada's ducks breed.

ADD TO KNOWLEDGE OF OUR NORTHERN COAST

(Continued from page 1)

of copper ores have also been made along the valleys of the Coppermine and Kendall rivers which extend the limits of the prospective mineralized area a considerable distance both east and north of the Hunter Bay locations.

Coppermine river was reached on August 15 but owing to fog and bad weather it was not until September 4 that Major Burwash was able to commence the northward and eastward exploration by aeroplane along the southern coast of Victoria island, with a one-hour stop at Cambridge Bay, to Petersen Bay, King William island. After spending the night there, the party flew along the east coast of the island until Sir James Ross strait was reached. From that point the west coast of Boothia peninsula was followed to the magnetic pole which was circled. The flight was then continued to Cape Felix and Victory point, where a landing was made on a fresh-water lake at 1 p.m. Photographs were taken throughout the journey. A minute search was at once instituted and continued for seven hours on this terrain so intimately associated with the Franklin expedition. Evidences of a camp were found in the vicinity of Franklin point, consisting of what had probably been caches for stores and walls of a rectangular tent. It was in this area that the only written record of the Franklin party was found by the M'Clintock expedition of 1859-60. Major Burwash in this instance found nothing except the stone structures.

On resuming the search the following day northward of Victory point, Major Burwash discovered a cairn that had evidently not been previously examined, but it contained only specimens of blue naval broadcloth. At a point opposite this cairn but close on shore there were discovered the remains of a fairly large camp. More broadcloth was found here, together with remnants of a linen tent, a number of ropes of various sizes, a small barrel stave, a piece of what appeared to be Welsh coal, and the rusted remains of what may have been a knife blade. These have been brought to Ottawa. Victory point where the graves of Sir John Franklin and others of his party were stated to be, was most thoroughly examined and found to be barren of any trace of the party. At Terror bay Major Burwash found one large grave which contained a number of human bones, possibly of more than one body. No writings or other objects of interest were found. The grave was carefully rebuilt.

The party then proceeded to Petersen Bay whence, after re-fuelling, the return flight was made along Queen Maud gulf to Cambridge Bay, across the northern end of Kent peninsula, and finally along Coronation gulf back to the mouth of the Coppermine river, Major Burwash later returning by plane and rail to Ottawa. In addition to the aerial photographs taken for mapping purposes, a remarkable series of pictures was taken by Mr. Richard Finnie. This record of the trip which includes both motion and still pictures, will not be ready for public view for some time.

The Topographical Survey, Department of the Interior, is preparing a map in two sheets showing the Rideau canal from Ottawa to Kingston. The northerly sheet from Ottawa to Smiths Falls has just been published and the southerly sheet will follow shortly.

EXTENSIVE PATROLS BY ARCTIC DETACHMENTS

Royal Canadian Mounted Police Made Numerous Special and Routine Trips This Year

The ss. *Beothic* which carried the 1930 expedition of the Department of the Interior on the annual patrol to posts in the Canadian Arctic archipelago has brought back from the North, Inspector A. H. Joy, Royal Canadian Mounted Police, and a number of members of that force who have completed their tour of service in the Eastern Arctic; Inspector Joy had effected an inspection of all the detachments in that part of the Far North. As usual these detachments were busy during the winter of 1929-30, over a dozen long patrols having been made. In addition many shorter journeys were made for sundry reasons.

At the northernmost detachment, Bache Peninsula, Ellesmere island, the usual patrol was made by Constables N. McLean and W. C. Beatty, across Ellesmere island and among the remote islands which lie to the west of it. Proceeding by a newly reconnoitred route directly across the island they reached Bay fiord, and then traversed Eureka sound and Beaumann fiord, skirting the shore of Axel Heiberg island, and recrossing Ellesmere island by a new and more southerly route to Makinson inlet on the east coast; thence the party travelled to Craig Harbour, in the south of the island, and returned up the east side of Ellesmere island to Bache Peninsula. This patrol discovered a valuable pass across Ellesmere island, by way of Makinson inlet, a feature of the coastline named after the constable who discovered it a few winters ago.

From Dundas Harbour in Devon island, Corporal M. M. Timbury and Constable R. W. Hamilton patrolled westward along Lancaster sound to the southeastern corner of the island and then turned north into Wellington channel and on to Grinnell peninsula, returning by the same route.

Baffin island was the scene of six or seven lengthy patrols. From Pond Inlet in the north, Corporal H. A. McBeth travelled by way of Arctic sound to Igloodik in Foxe basin, returning by Admiralty inlet and Lancaster sound. Constable F. W. S. Ashe patrolled from the same detachment along the north-east coast of Baffin island to Home bay and return. Three patrols were made from Pangnirtung in central Baffin island, namely: by Sergeant O. G. Petty to Home bay; by Constable C. O. Moore to Cape Mercy; and by Constable Moore along the southeast coast, visiting the Eskimo camps. From Lake Harbour in the south of the island, Constable J. C. M. Wishart patrolled to Frobisher bay, while Corporal A. McK. McKellar made two patrols westward to Cape Dorset, the southwest corner, and northward for some distance along the western coast.

At Port Burwell Corporal F. McInnes made a patrol along the coast of Labrador, while Constable W. G. Kerr travelled to George river and back.

From Chesterfield two patrols to Churchill were made by Staff Sergeant M. A. Joyce and Constable J. W. McCormick, while Corporal H. G. Nichols patrolled from Baker Lake to Chesterfield, and did a good deal of



Canada's Arctic Regions—A recent photograph of the waterfront at Herschel on Herschel island. The numerous auxiliary power schooners shown at anchor at this port in the Western Arctic reflect the prosperity of the natives in this part of Northern Canada since most of these schooners are owned by Eskimos. Fur-bearing animals were plentiful this year and some remarkable catches were reported.

WILD LIFE CONSERVATION IN THE FAR NORTH

Officers of North West Territories and Yukon Branch Carry on Important Work in Hudson Bay and Great Slave Lake Areas

The wild life of Northern Canada forms the main source of supply of food and clothing for the natives of our Arctic regions and its conservation is one of the important functions of the North West Territories and Yukon Branch of the Department of the Interior. In fact the health, well being, and prosperity of the natives in the Far North is the particular care of the Branch and each year scientific investigators and administrative officers go into the north country to further the best interests of the native inhabitants.

During the past summer Messrs. A. E. Porsild and W. H. B. Hoare of the North West Territories and Yukon Branch have been busily engaged in different parts of the Territories in conservation work. In the latter part of June Mr. Porsild left Ottawa en route to the area inland from the west coast of Hudson bay in the immediate vicinity of Yathkyed lake and the Kazan river. The purpose of the trip was to investigate the reindeer grazing possibilities of the area. Mr. Porsild proceeded by train to Churchill, the terminus of the Hudson Bay railway and on July 12 started on his explorations on board a Royal Canadian Air Force plane. From the air he surveyed the country along the shore northward to Nunulla, then inland for a distance of about seventy miles from the coast. The plane then returned and touched at Eskimo Point and Tavane. A much larger plane arrived at Tavane from Churchill and the trip westward was made on July 30. This larger plane was necessary to transport the supplies and equipment for the voyage by canoe

travelling in the neighbourhood of his post.

Detailed reports of the patrols in the Western Arctic have not yet been received but these are for the most part regular and not in the nature of special patrols as in the Eastern Arctic. In fact throughout the Mackenzie valley and along the Western Arctic coast from Herschel to King William island the police patrols are as much a matter of course as in the northern parts of the Prairie Provinces.

down Yathkyed lake and the Kazan river. Accompanied by an assistant. Mr. Porsild made a detailed investigation of the country, collecting specimens of the flora and fauna, taking observations, and mapping the watercourses as he proceeded northward with Baker Lake as his objective. Throughout the greater part of the journey caribou and caribou trails were noted in large numbers, while many other forms of wild life were in abundance.

Arriving at Baker Lake on August 30. Mr. Porsild was transported by plane to Chesterfield where he awaited the arrival of the ss. *Beothic*, carrying the Department of the Interior's 1930 Arctic expedition. On the outward voyage the *Beothic* made a stop at Coats island in the northern part of Hudson bay to allow Mr. Porsild to carry out a biological survey of the island looking to its utilization as a grazing area for reindeer. Later he proceeded to North Sydney with the ship, returning to Ottawa in mid-September.

Mr. Hoare's movements were in connection with the establishment of a warden service in Thelon Game Sanctuary, the 15,000 square mile preserve east of Great Slave lake, set aside by the Dominion Government for the protection of the only known herd of muskoxen on the mainland of Canada. On June 21 Mr. Hoare started north from Ottawa. He proceeded by way of Churchill and Chesterfield and after assembling his supplies and materials at Baker Lake post he moved up the Thelon river to the easternmost boundary of the sanctuary. Two cabins are to be erected in addition to the headquarters cabin already built at the junction of the Thelon and Hanbury rivers. The first of these will be situated at the eastern end of the sanctuary while the other will be located on Artillery lake on the western boundary of the reserve.

WESTERN LAND SETTLEMENT

Homestead Entries and Soldier Grants Made in September, 1930

The following statement compiled in the Dominion Lands Administration of the Department of the Interior shows the number of homestead entries and soldier grants made in Saskatchewan

GRATIFYING REPORT ON AFFAIRS IN THE YUKON

Mining, Wild Life, Health, and Other Matters Dealt with by Gold Commissioner

Mr. George I. MacLean, Gold Commissioner of Yukon Territory, one of the senior officers of the Department of the Interior, recently paid his customary visit to the head office of the Department at Ottawa.

Mr. MacLean states that affairs in Yukon Territory are moving on steadily and hopefully. While the present low prices for silver, lead and copper naturally have a tendency to slow up the work of prospecting for and extracting those metals, nevertheless the silver mines of the Keno-Mayo group have ore of such high quality that they are continuing operations with no great change in the total output. On the other hand the relatively high price of gold has had the opposite effect on both placer and quartz mining for that precious metal. Quartz gold mines on the upper waters of Bonanza creek have been worked for some time, but recently some new developments have led to greatly increased interest in the properties there and important results are hoped for. In the southern part of the Territory on Lake creek in Hootalinqua district, a new find of placer gold is reported. The area embraced in the original discovery being now pretty thoroughly staked, the question whether there will be any rush into the district will depend upon the results of prospecting on adjoining creeks. Dredging and hydraulicking operations for gold production this year compare favourably with those of the past few seasons.

Wild life conditions continue good and the export of furs will be about the same as in former years. Caribou, moose, mountain sheep, and mountain goat are increasing in numbers and bears are very numerous in all parts of the Territory. Wolves and other predatory animals are being kept in check by the bounty of \$30 for wolf and \$15 for coyote, the pelts in each case becoming the property of the Department.

Farming, lumbering and coal mining are limited to the needs of the different settlements owing to the cost of transportation. The past summer was a particularly fine one and all the crops sown gave large returns. Owing to the worldwide business depression, travel, both for recreation and for big game hunting, was less than for a few years past, but those tourists who came in, especially the big game hunters, were well pleased with the results of their trip.

The health of the people of the Territory was exceedingly good throughout the year and the schools, transportation routes, hospital and other services were maintained in a state of thorough efficiency.

and Alberta during the month of September, 1930, as compared with the same period last year:

Agency	Homesteads		Soldier Grants	
	1929	1930	1929	1930
Calgary.	29	63	3	4
Edmonton.	298	523	14	26
Grande Prairie.	100	109	3	6
Lethbridge.	12	26	1	..
Moose Jaw.	107	4	5	..
Peace River.	167	248	11	18
Prince Albert.	315	20	17	4
	1,028	993	54	68

Total for 1929—1,082; for 1930—1,061.

NATURAL RESOURCES CANADA

Published by DEPARTMENT OF THE INTERIOR, Ottawa

VOL. 9

DECEMBER, 1930

No. 12

SOVEREIGNTY OVER SVERDRUP ISLANDS DULY RECOGNIZED

FRIENDLY ACTION TAKEN BY NORWAY

The One Possible Ground of Dispute to Canada's Title in Arctic Sector North of Mainland Removed

The Government of Norway has formally recognized the Canadian title to the Arctic islands commonly known as the Sverdrup group, comprising Axel Heiberg, Ellef Ringnes, Amund Ringnes, and King Christian islands. The group is situated west of Ellesmere island in an area the centre of which is about eleven degrees or roughly 700 miles from the North Pole. Axel Heiberg, the largest island of the group, is about 225 miles long and 75 miles wide. This friendly action, on the part of the Norwegian Government removes the one possible ground of dispute as to Canadian sovereignty in the whole Arctic sector north of the Canadian mainland.

The islands in question were discovered and explored in the years 1898-1902 by Commander Otto Sverdrup, leader of the Norwegian Polar Expedition in the *Fram*. In the spring of 1900, Commander Sverdrup took possession of the islands in the name of his sovereign, but no further act of occupation took place. The Dominion of Canada has long claimed sovereignty over the entire area north of the mainland. On July 31, 1880, the rights acquired by Great Britain in this area were transferred to Canada by Order in Council providing that "all British territories and possessions in North America and islands adjacent to such territories and possessions which are not already included in the Dominion of Canada, shall, with the exception of Newfoundland and its dependencies, be annexed to and form part of the said Dominion." The title thus based on geographical contiguity and British discovery and exploration, was completed by effective occupation and administration, under the Department of the Interior.

The Canadian Arctic sector has been indicated on official maps and defined in official statements, notably by the Minister of the Interior, in the House of Commons in June, 1925. The maps and public statements indicated that Canada claims all the territory north of the Canadian mainland in the sector lying between meridians 60 and 141.

In view of the possibility of conflicting claims in the Sverdrup Islands area, the matter was made the subject of

(Continued on page 3)

WINTER PASTIMES IN CANADA

Thousands Await Season of Ice And Snow to Enjoy Its Many Recreational Advantages

Preparations for Canada's great winter season are now being enthusiastically pushed forward by sport lovers throughout the country and thousands are looking forward to the arrival of the season of ice and snow. The gloriously sunshiny days, with their crisp, ozone-laden air scented with pine, blue skies, and white snow beckon both Canadians and visitors from less favoured

marked ski trails assure those visiting unfamiliar territory that they will find a comfortable cabin at the end of the trail. The visiting tourist who delights in ski-ing and other winter sports is always welcome at local clubs. Guides may nearly always be procured by those who desire an adventurous journey to districts practically inaccessible at other seasons.



Winter Sports in Canada—As the above illustration shows Canadians of all ages enthusiastically engage in open air recreation during the season of ice and snow. The upper portion of the picture indicates a few of the many forms of outdoor sport enjoyed in the suburbs of towns and cities. Inset is a group of husky youngsters romping in the snow.

climes out into the open there to refresh both mind and body. Canada's winter extends from December until March. During these months, play in the open takes many and varied forms. From the tiny tot who romps in the snow and builds snow-houses and snow-men to the still youthful man of sixty who curls or skis, Canadians in all walks and stages of life find some time to devote to outdoor recreation in winter.

From the Atlantic to the Pacific, snow-clad mountains, hills and valleys offer an exceptional opportunity for a variety of winter sports. The principal recreational sports during the winter season are ski-ing, snowshoeing, skating, tobogganing, curling, hockey, and dog derbys, all of which may be enjoyed under ideal conditions. Activities, such as ice-boating, are confined principally to land-locked bays and small lakes.

A noticeable increase in inter-club and international competitions is evidence of the popularity and beneficial result of winter sports. Both covered and open-air rinks provide first-class facilities for skating, hockey, and curling, and in numerous districts well-

The matter of accessibility and accommodation should cause little concern to those who visit Canada during the winter season. Within twenty-four hours after leaving New York, Chicago, Philadelphia, and other large United States cities, the vacationist may participate in carnivals, fetes, and competitions amid the inspiring surroundings of Canadian winter scenery.

While motor travel is not so general during the winter season as in summer and autumn, there are many long stretches of highways where the motorist is assured of comfortable travelling conditions. A number of provincial highways in the different provinces are kept open throughout the winter months, and in the cities and towns and their vicinity motor travel is almost as general as during the summer and autumn months.

Every part of Canada provides opportunities for the enjoyment of a wide range of winter sports, but there are certain provinces and districts in which one or more lines of outdoor activity are followed more enthusiastically than

(Continued on page 3)

FORMALLY OPEN WINDSOR-DETROIT VEHICULAR TUNNEL

APPROPRIATE CEREMONIES MARK EVENT

New Medium of Rapid Communication Provided Between Canada And the United States—Cordial Messages.

A new bond of peace and friendship was forged and another means of safe and rapid communication between Canada and the United States provided by the completion of the Windsor-Detroit tunnel which, on November 1, was formally opened. This event also indicates the tremendous change in transportation methods and in the popular outlook caused by the advance of the motor car in the last few years.

The opening of this great tunnel under the Detroit river, a structure so capacious as to permit the passage of a thousand motor cars per hour, each way, was marked by appropriate and dignified ceremonies, participated in by leaders in the political, religious, and business life of both countries. For the occasion, places of assembly had been provided at both ends of the tunnel, where large numbers gathered to take part in the proceedings and by the use of the latest developments in speech transmission these two audiences, separated by the mile-wide river, were able to hear clearly the speakers who addressed them alternately from the Detroit and Windsor ends of the tunnel. The honorary chairman for the day was Hon. F. W. Green, Governor of the State of Michigan, the executive chairman, Mayor Frank Murphy of Detroit and Mayor Cecil E. Jackson of Windsor, while the invocation was pronounced by Most Rev. David Williams, Anglican Archbishop of Ontario. The speakers, in the order in which they spoke, were: Senator Arthur H. Vandenberg of Michigan; Hon. George S. Henry, Acting Premier of Ontario; Hon. Hanford MacNider, United States Minister to Canada; Col. Sidney C. Robinson, M.P. for Essex East; and Hon. Thomas G. Murphy, Minister of the Interior, representing the Dominion Government.

When the program of addresses ended shortly before noon, the turning of an electrical switch by President Hoover in Washington started the ringing of the gongs beside the speakers' platforms, which marked the formal opening of the great tube. This was the signal for an outburst of cheering and the singing by the audience in Windsor of "God Save the King," while that in Detroit sang "America."

The official parties from both ends then proceeded by automobile to the

(Continued on page 3)

DOMINION OBSERVATORY STUDIES EARTHQUAKES

An Important Division of Work—Canada Remarkably Free From Destructive Disturbances

One of the major divisions of study at the Dominion Observatory, Department of the Interior, Ottawa, is that of earthquakes. Few regions of like extent are so free from really destructive earthquakes as is Canada—thanks largely to the ancient Laurentian foundation which underlies so much of the country. But this very circumstance is a favourable factor in the collection of the scientific data which the study of seismology entails. In other words, the study of earthquakes in Canada—not of Canadian earthquakes—is largely a means to a scientific end, and one of its main objects is to throw light on the structure of the interior of the earth.

A generation or two ago the accepted picture of the earth was that of a globe with a fiery, molten interior, surrounded by a crust comparatively thin; here and there, through weak points or fractures in the crust, the molten interior bubbled up, to carry death and destruction in its wake in the form of active volcanoes. Now all this is changed. We know that volcanoes are nothing more than shallow pustules in the surface, due to local causes and extending down a few miles at most. Elsewhere the earth is solid and of great rigidity, at least to very great depths.

But how can earthquakes throw light on matters such as these? Quite simply, when the mechanism is understood. An earthquake is a sudden cleavage, or more usually a slipping along an already established line of cleavage, or fault-line, in bed rock, by which long-accumulated strains are released. If the disturbance is deep-seated, mechanical vibrations are set up which shake the whole earth. In the vicinity of the origin the vibrations are often extremely violent; at increasing distances they become progressively fainter, but for large earthquakes they are recorded on seismographs everywhere. It is the passage of these vibrations through the earth that tells the tale.

Earthquake vibrations, or waves, are of four kinds. Waves of two distinct kinds travel along the surface, penetrating to a depth of only a few miles, and carry with them information about the surface layer through which they have passed. Of even greater interest, however, are the waves which pass through the interior of the earth. They also are of two kinds, known as longitudinal and transverse. The longitudinal waves, like those of sound, are marked by a to-and-fro vibration of the individual particles of the medium along the line of propagation of the disturbance. Such waves can travel in different velocities, through gases, liquids, or solids. Quite other are the transverse vibrations, similar to those induced by plucking or bowing the end of a rod; mechanical vibrations of this type can be propagated only through a solid medium.

Earthquake waves of the above types can be disentangled and distinguished by suitable instruments. Obviously, the more distant the receiving station from the origin, the greater the depth to which the waves will penetrate; thus the Ottawa seismologists, when study-

MINING ACTIVITY IN NORTHWEST TERRITORIES

Supervisory Mining Engineer, Department of the Interior, Reviews Exploration and Investigation Work During Past Season

During the past season exploration for minerals and investigations of discoveries in the Northwest Territories were continued actively. The results may be summarized as reasonably successful. Discoveries have been chiefly of base metals—copper, lead-zinc, and nickel—but in the mineralized areas too little work has yet been done to determine their possibilities. The occurrence of cobalt and uranium at the southeasterly side of Great Bear lake, is somewhat similar to the cobalt area of northern Ontario, and suggests silver possibilities. The apparently extensive copper deposits of the Coppermine area resemble the Michigan deposits in mode of occurrence and geological situation, and point to this district as one of the big copper reserves of the future, while the development work of the season has demonstrated new possibilities in the lead-zinc deposits of Great Slave lake.

There were three principal areas of interest. On the east the Cyril Knight Prospecting Company continued their investigation of their pyrrhotite find on Rankin inlet, on the west coast of Hudson bay. A diamond drill was brought in to prove the thickness and character of the mineralization, and to determine its dip and value at greater depths.

In the south, active work was carried on in the lead-zinc area south of Pine point on Great Slave lake. A systematic study of the deposits is being made by careful surface investigation and by drilling. Dominion Explorers examined a silver-lead discovery on the upper reaches of the South Nahanni river. Ore of possible commercial value was found, but in a situation difficult of access. Drilling for oil in the vicinity of the

ing the deeper layers of the earth's interior, are mainly interested in quakes occurring far beyond the boundaries of Canada. At the present time, for example, a special study is being made of an earthquake that occurred in 1927 in Japan.

The interpretation of the records is much complicated by the occurrence of reflections and refractions of the earthquake waves in the interior of the earth, at surfaces of separation of layers of different materials. Once the key has been found, however, these very complications make it possible to measure the depths of the various discontinuities and many of the properties of the different layers which compose the earth. The surface rock-mantle as a whole, though further sub-divided, is known to extend to a depth of something like thirty miles. Various deeper layers have been more or less certainly identified, but in particular a "core" of about 4,300 miles diameter, with properties differing markedly from the remaining portions of the earth.

Until very recently, at least, no transverse vibrations had been certainly identified as passing through the core, which was therefore believed by many authorities to be liquid or viscous. During the past summer, however, one eminent seismologist believes he has identified such waves. Should this be confirmed it will mean that the earth is solid to the centre. In any event we may probably look forward to a definite solution of the problem in the not distant future.

mouth of Hay river, which was started in 1922 and abandoned, was resumed this year.

The chief northern field of interest was in the country between Great Bear lake and the Arctic coast. A rich discovery of copper sulphides was staked in 1929 at the easterly extremity of McTavish bay. This attracted considerable interest during the past season. Dominion Explorers became interested in this find and brought in men and materials by aeroplane during the spring. LaBine brothers moved into the same area, and Consolidated Mining and Smelting Limited also established a base there. During the season, fairly intensive prospecting was carried on and a number of claims were staked by the various companies. The copper ores appear to be both rich and abundant. A discovery of pitch-blende was made in the same general locality that has considerable interest as a possible source of radium. Associated with it are cobalt, bismuth, and other minerals. Northeast from Great Bear lake the Coppermine formation occupies a wide area, extending to the Arctic coast and islands. Northern Aerial Minerals Exploration Company, Limited, covered a large part of this area with aerial observations, and in detail on the ground at many points. Their prospectors found the formation generally mineralized, but lacking in commercial concentration except in certain situations. Six discoveries were made in the western portion of the area. These are all copper sulphides, and one in particular is very promising. Both Northern Aerial Minerals Exploration and Dominion Explorers staked claims in this district. As early as 1820 an occurrence of galena was noted on the Arctic coast near Detention harbour. During the past season, claims were staked in the vicinity of Galena point as it is called, where it is reported rich, silver-bearing galena has been found. A find of Iceland spar, near the Arctic coast to the west of Mackenzie river, was investigated by the Dominion Explorers.

Results have given the needed encouragement to the exploration companies which have been carrying on operations in the Northwest Territories during the last three years, and support the optimism of those who have looked to the minerals of the North to assist in its development. The Supervisory Mining Engineer's Branch of the Department of the Interior has established an office at Fort Smith, in the Northwest Territories and field parties have followed the mineral investigations in the various districts in order to keep the Department in touch with the situation, and to enable it to assist with the problems of development as they arise.

ALBERTA OIL PRODUCTION REACHES 129,007 BARRELS

September Total Was Highest On Record—Steady Increase in Output

The production of oil in Alberta continued to increase according to figures for the month of September compiled in the Department of the Interior from the reports of operators.

THE CHRISTMAS TREE TRADE IN CANADA

Forest Service, Department of the Interior, Deals with the Subject in Interesting Pamphlet

Under title of *The Christmas Tree Trade in Canada*, the Forest Service of the Department of the Interior at Ottawa has a pamphlet dealing with the subject of the annual harvest of coniferous trees—pine, spruce, fir, and cedar—for use at Christmas. The aim of the pamphlet is to present the viewpoint of the practical forester on certain phases of the trade and it is of particular interest at this time of the year when considerable attention is being given to the matter of decorations for the festive season.

Christmas trees are, in the main, secured from sites of three kinds. The best trees for the purpose are open-grown, with many sturdy branches; usually seedlings on old pastures adjoining forests. The supply may also come from land being cleared for farming or, finally, from the natural forest, the plantation, or the woodlot.

It is evident that there can be no objection to utilizing trees from old pastures or from clearing operations. In the first case the trees are detrimental to the pasture and, owing to the many knots unsuitable for lumber. In the second, failing their sale for Christmas festivities, they would be cut and either burnt or left to create a fire hazard.

It is only in the case of trees from the third site that there can be any objection to this traffic and this can be surmounted by intelligent selection of the trees removed. Of the total number of seedling trees on any acre, only about 25 per cent (and often less) reach maturity. The rest are crowded out by their lustier neighbours in the battle for food, moisture, and light. Experience will indicate in ample time those individuals in a crop of young trees that nature will eventually eliminate. They may be culled out and an interim dividend thus realized on the forested area. Not only does a revenue result from this thinning but the trees that are left to mature benefit by the lessened competition.

Two practices are to be condemned. First, the felling of mature trees from which only the top is removed for Christmas tree use, and, second, the wholesale, indiscriminate hacking down of young growth, the trees that are marketable being afterwards selected, while the remainder are left to waste.

The pamphlet, which may be secured upon application to the Forest Service, points out in conclusion that an area of ninety-six square miles permanently and entirely devoted to the growing of Christmas trees would take care of an annual harvest of 5,000,000 trees—a number considerably in excess of the present cut.

Naphtha production, which reached 118,544 barrels during the month of September, 1930, came from the lime in Turner Valley. The light crude output was from the formation above the lime in Turner Valley and from the Red Coulee field, while the heavy crude was produced in the Wainwright and Ribstone fields.

The comparative figures follow:—

	Naphtha (Barrels)	Light Crude (Barrels)	Heavy Crude (Barrels)	Total (Barrels)
Sept. 1930.	118,544	9,432	1,031	129,007
Sept. 1929.	84,677	4,678	848	90,203

NATURAL RESOURCES CANADA

PUBLISHED BY

THE DEPARTMENT OF THE
INTERIORHON. THOMAS G. MURPHY,
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Deputy Minister

Natural Resources, Canada, is published monthly for the purpose of promoting interest and supplying information regarding Canada's natural resources and their development. Inquiries respecting any matter or document dealt with should be addressed to The Secretary, Department of the Interior, Ottawa.

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OTTAWA, DECEMBER, 1930

FORMALLY OPEN WINDSOR-DETROIT VEHICULAR TUNNEL

(Continued from page 1)

centre of the tunnel, where, with handshakings and words of welcome, the bow in the silk ribbon stretched across the roadway was untied and the ceremony concluded.

The various speakers saw in the tunnel a symbol of the amity which exists between the nations concerned. The United States speakers, representing the federal, state, and city governments, spoke of the great improvement in transportation just effected and united in stirring appeals to the people of both nations never to sever the long peace between them but to work together to solve their joint perplexities. From the Canadian side the messages were no less cordial.

His Excellency, the Governor General, wired: "Having seen the tunnel when under construction on my recent visit, it is a particular pleasure to send my warmest congratulations on its completion and on the opening of this additional means of friendly communication between the United States and Canada."

Sir George Perley, Acting Prime Minister of Canada, wrote expressing his appreciation of the value of this work in its various relations, concluding as follows: "The Government of Canada is happy on this occasion of achievement to join its congratulations to those which are flowing in from all sides, on the spirit and progress of the community which the opening of the tunnel exemplifies, and on the courage and enterprise of those who, in both countries, co-operating in the overcoming of all physical and financial obstacles, made possible the provision of this additional medium of friendly commerce between the United States of America and the Dominion of Canada."

Hon. George S. Henry, Acting Premier of Ontario, stressed the fact that intercourse meant understanding, the removal of doubts and difficulties, and that the tunnel would be a factor in bringing closer together Canada and the United States, as they went forward year by year in their marvelous development.

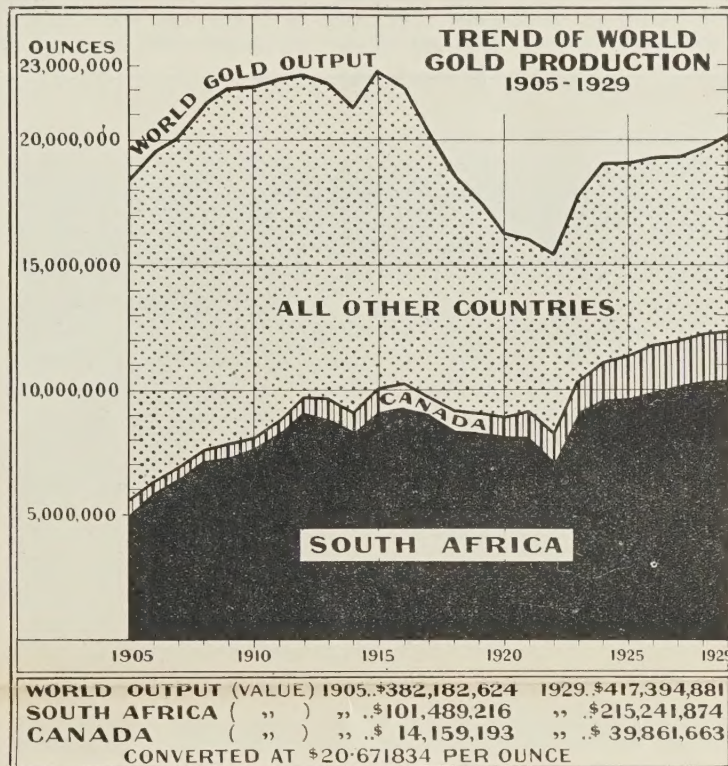
Col. S. C. Robinson, M.P. for Essex East, noted that this was the only tunnel of its kind in the world connecting two nations and he called attention to the exchange of tourists between Canada and the United States, with its northward tide in summer and its southward flow in winter.

Hon. Mr. Murphy, who represented the Government of Canada, opened

TREND OF WORLD GOLD PRODUCTION, 1905-1929

Few economic questions are being more keenly discussed throughout the world to-day than that of the supply of gold for monetary use. In this subject Canada has a double interest—her interest as a gold-producing country, and also as a trading nation vitally concerned with anything and everything that is fundamental to world prosperity.

While most of the discussion has centred upon the need for better distribution and use of the existing stocks of gold, there has been also a note of real anxiety over the possibility of an actual shortage of gold supplies. This anxiety arises from an anticipated early drop in South Africa's output. As the accompanying diagram indicates, the burden of maintaining the level of world gold production during the last twenty-five years has been borne in ever-



increasing degree by South Africa. The total gold output of the rest of the world had fallen by nearly 30 per cent in 1929 as contrasted with 1905.

One point of special interest from the Canadian standpoint is the fact that, in the writings of almost all students of the gold situation, little or no importance has been attached to Canada's rising output. It is true that the Dominion's production has never bulked largely in the world's total output, but it has grown, and is continuing to grow, substantially. With gold being produced in larger quantities either from gold properties or from huge ore bodies in which gold is associated with other metals, it may well be that Canadian resources are destined to play a much more prominent part than has yet been foreseen, in offsetting the expected depletion of the South African goldfields and the threatened embarrassment of the world's monetary systems.

with a reference to the rapidity with which great events followed one another in this fast-moving age. Four years ago when he visited the Border Cities and Detroit he had heard people talking of building a bridge or a tunnel across the Detroit river, but neither he nor the people with whom he talked dreamed that within less than half a decade both a bridge and a tunnel would be in operation. Canadian and United States citizens had put their shoulders to the wheel and both projects stood as triumphs of energy and co-operation over obstacles of every kind. The progress of the cities on both sides of the river had been amazing. Detroit in a few years had become one of the most famous centres in the world in the field of specialized manufacture, while the Border Cities yielded to no other portion of the Dominion in the rapidity of their industrial advancement in the past decade. He called attention to the relation of the tunnel to the automobile and spoke of the immense increase in tourist traffic, especially to those great scenic and recreational areas contained in Canada's national parks. In these and in other areas of natural beauty thousands of visitors had found a tourists' paradise

to which they returned each succeeding year in increasing numbers. He concluded by expressing a wish for the continued prosperity of the two great communities served by the tunnel and his firm belief that this new link would work to the mutual advantage of Canada and the United States.

WINTER PASTIMES IN CANADA

(Continued from page 1)

the others. This is in most cases due to local topography and the predilections of the inhabitants.

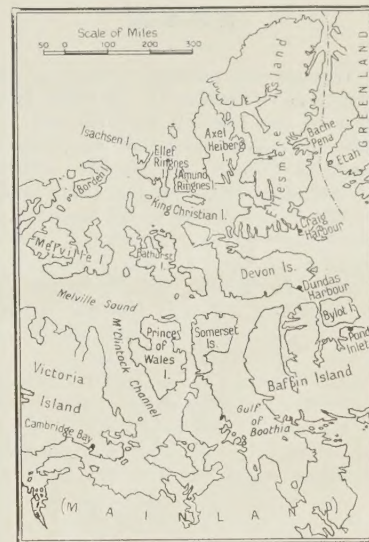
Hockey and skating go hand in hand as Canada's foremost winter sports. In order to play hockey one must be proficient in skating, hence there is an inseparable connection between these two lines of activity. The provision of hundreds of outdoor and covered rinks aids in placing these sports to the fore in our winter pastimes.

While the climate of the Maritime Provinces is somewhat milder than that of the interior, practically all forms of winter sports have their devotees. In the province of Quebec the major events centre in and around Quebec city, the territory extending north to the Lake St. John district, Murray Bay, Montreal city and vicinity, the

SOVEREIGNTY OVER SVERDRUP ISLANDS DULY RECOGNIZED

(Continued from page 1)

discussion between the Norwegian and Canadian Governments. A definite



Sketch map of a portion of the Northwest Territories, Canada, showing the location of the islands of the Sverdrup group—Axel Heiberg, Ellef Ringnes, Amund Ringnes, and King Christian.

settlement of the issue has been formally expressed in an exchange of notes which was effected in London and Oslo.

Eastern Townships, the Laurentian mountains and Montebello and the territory tributary to the Ottawa river.

Lovers of winter sports will find considerable territory in the province of Ontario which is ideal in location and scenic beauty. Ottawa, the Dominion Capital, is adjacent to some of the finest ski country on the continent, while the best of ice-yachting may be enjoyed in Toronto bay and in the bays along lake Ontario. In the Muskoka and Algonquin Park districts, in the Highlands of Ontario, the visitor is assured of all forms of winter sports among pleasant surroundings.

In Manitoba, Saskatchewan, and Alberta, the different cities and towns are well provided with facilities for hockey, curling, snowshoeing, ski-running, and sled-dog racing. The Winnipeg curling bonspiel is an annual event which attracts large numbers of visitors and competitors from the Prairie Provinces as well as other parts of Canada and from the United States. The dog derby held at The Pas in northern Manitoba also receives widespread attention, this marathon race being an event of international interest. Banff, situated in the Canadian Rockies in Alberta, is one of the most important centres for winter sports on the continent. The annual winter carnivals held at Banff in Banff national park and at Jasper in Jasper national park are outstanding among Canada's recreational attractions.

In British Columbia, Canada's most westerly province, there are a number of areas which have an especial appeal during the winter season. An annual ski tournament held in Revelstoke is a particularly attractive event, while golf, tennis, and other summer sports are enjoyed every day in the year on the islands and mainland of the southwestern part of the province.

Those who visit Canada in winter find her climate invigorating, healthful and enjoyable. It is a season of the year when exercise and outdoor life restore health and strength, and the visitor is always assured of personal comforts amid pleasant surroundings.

SPLENDID EXHIBIT OF OUR WOOD PRODUCTS

Occupied Important Section in National Produced-in-Canada Exhibition at Montreal

Through the personal interest of the Honourable Thomas G. Murphy, Minister of the Interior, in furthering the sale to home consumers of products made in Canada, an extensive exhibit of Canadian wood products was made by the Forest Products Laboratories of the Forest Service, Department of the Interior, at the National Produced-in-Canada Exhibition held November 3-8 in Montreal. Nearly 200,000 people visited the exhibition and manifested a keen interest in the display.

The exhibit of the Forest Products Laboratories consisted of a wide range of Canadian wood products, representing about fifty industries depending on Canadian woods for their raw material. In the main the exhibit was divided into three sections: (1) pulp and paper, (2) lumber, and (3) veneer and plywood.

The Pulp and Paper Section had as its principal display a large panel 12 feet in length by 7 feet in height on which was illustrated the processes in the manufacture of four kinds of wood pulp, viz., groundwood, sulphite, sulphate, and soda. Rolls of newsprint and kraft paper were shown, and also pulp products, such as insulating boards, paper bags, fibre conduits, writing paper, wall paper, cellophane, and rayon. Adjoining the Pulp and Paper Section was an illuminated panel showing products of distillation from Canadian hardwoods.

In the centre of the whole exhibit was the Lumber Section with coloured transparencies showing logging scenes in Canadian woods. A Douglas fir timber 20 feet long and 12 by 12 inches in cross section served as a counter. On one side were placed twelve boards each 6 feet in length of the principal commercial species, and in the centre of this display was set a highly polished panel containing small specimens of 72 woods grown in Canada. On the other side of the stand was erected an exterior wall of a wood cottage, very attractively finished. Close by a device showed a bush fire in a realistic manner, with the admonition, "Prevent Forest Fires, It Pays."

In the Plywood and Veneer Section the principal feature was an arrangement of coloured transparencies showing the processes in manufacturing rotary cut veneer. At one end of the exhibit was a section of an entrance hall of a house panelled entirely in natural finish Canadian birch, which was much admired.

NEW PUBLICATION

The Blue Goose: An Account of its Breeding Ground, Migration, Eggs, Nests and General Habits, by J. Dewey Soper of the Department of the Interior, Canada. This is a statement of the results of Mr. Soper's work between 1923 and 1929 in the search for, and the discovery of, the breeding ground of this important bird, on the shores of Foxe basin, Baffin island. The contents include besides narrative and descriptive matter, 17 illustrations, 2 maps, and a coloured frontispiece. Price 50 cents, post free, on application to the Director, North West Territories and Yukon Branch, Department of the Interior, Ottawa.

AERIAL SURVEYING IN CANADA

The 1930 Season a Record One—Spectacular Features of the Year's Operations

The aerial activities of the Department of the Interior in co-operation with the Royal Canadian Air Force, for the season of 1930, are approaching completion, and while it is not yet possible to give a detailed summary of the season's work, enough is now known to mark 1930 as a record year in aerial surveying in Canada. The most spectacular feature of this year's

Canadian Air Force throughout the North.

This flight left Ottawa on July 6, and proceeded to Aklavik via the Mackenzie river, then to Great Bear lake and Coronation gulf and on to Great Slave lake. After a flight to lake De Gras, the expedition followed the Thelon river to Baker lake and Chesterfield inlet and thence north to cape Fuller-



Aerial Surveying in Canada—An interesting view from the air of the far northern post of Chesterfield on the west coast of Hudson bay, taken during the remarkable flight by officers of the Royal Canadian Air Force along Canada's Arctic coast. The arrows indicate: (1) An Eskimo encampment; (2) The trading post and other buildings of the Hudson's Bay Company; (3) The Roman Catholic mission and new hospital; (4) The residence and surgery of the Department of the Interior's medical health officer; (5) The Royal Canadian Mounted Police detachment; and (6) The wireless station operated by the Department of Marine. At the edge of the lake on the extreme right may be seen one of the planes of the aerial survey expedition.

operations has been a series of remarkable flights over the almost unexplored areas of the Northwest Territories and our Arctic coast which inaugurated a new era in Canadian aviation. The results will have a far-reaching effect on the future development of our northern frontier.

The remarkable flight of Major L. T. Burwash of the North West Territories and Yukon Branch to King William island in an aeroplane chartered from one of the aerial operating companies resulted in extending our geographical knowledge of the Arctic seaboard, and in throwing further light on the sad fate of the Franklin expedition. The information obtained will also be of great value in indicating the possibilities for future exploration by aeroplane.

A second notable pioneering flight was carried out by a detachment of the Royal Canadian Air Force commanded by Flight Lieutenant F. J. Mawdesley. Mr. C. S. Macdonald, D.L.S., of the Department of the Interior, acted as navigator and had charge of the aerial survey and other scientific work of the expedition. The purpose of this flight was to explore and photograph from the air the main aerial and water routes of the Northwest Territories, so that maps can be prepared for the assistance and guidance of future travellers by land or air. A secondary object was the inspection of the gasoline caches of the Royal

ton, Wager inlet, and Repulse bay. Returning to Chesterfield the western shore of Hudson bay was followed to Churchill which was reached on September 21. The flight from there to Ottawa was merely a matter of routine flying. In all, this detachment flew some 12,000 miles. Much of the flying was over unknown territory and unmapped routes and 3,100 photographs were taken.

Aerial photography has been carried out during the season in nearly every province from coast to coast and the results in area covered will probably approach closely the record of 70,000 square miles established last year. The areas photographed this year for mapping purposes include important mining districts on Vancouver island, in central British Columbia, in the vicinity of lake Athabaska, and near Great Slave lake. Photography for the maps of the National Topographic Series issued through the Topographical Survey has been carried on in British Columbia, central Saskatchewan, and western Ontario. In Ontario large areas have been photographed in the following localities: Fort William, Port Arthur, lake Nipigon, Kitchener, Kingston, North Bay, and at the new coal-fields on the Abitibi. In Quebec the work has been concentrated in the vicinity of Montreal and in the district between Ottawa and the Transcontinental railway. In the Maritime Provinces the

VALUABLE ARCTIC MAPS AND RECORDS ACQUIRED

Canada Makes Pecuniary Grant to Commander Sverdrup in Recognition of His Work

Canada has acquired by purchase the valuable original maps, notes, diaries, and other documents relative to the explorations and discoveries of Commander Otto Sverdrup, famous Norwegian explorer, in the Canadian Arctic archipelago. At the last session of Parliament, the Dominion Government made provision in the supplementary estimates to cover a proposed grant of \$67,000 to Commander Sverdrup in recognition of his work in the Canadian North and to purchase his records. The grant has just been made by the Canadian Government in accordance with this provision.

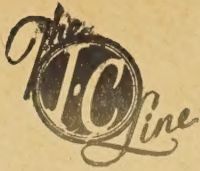
It was in 1898 that Commander Sverdrup started in the polar vessel *Fram* on his expedition to the Arctic. The expedition took four years and cost some \$200,000. The explorer covered the region between 76° and 81° 40' North Latitude and 76° and 107° West Longitude, an area of about 100,000 square miles. The region forms part of the Canadian archipelago. Commander Sverdrup did invaluable work, and his survey of the Axel Heiberg, Amund Ringnes, Ellef Ringnes, and King Christian islands, which he has carefully mapped, and the scientific research which he has carried out there, represent not only an unusually fine piece of exploration but also a remarkable contribution to science which has given very important results in a great many different branches of knowledge. They have been most useful to the Department of the Interior and to the Royal Canadian Mounted Police, in their annual patrols. These services to scientific research in the Canadian sector of the Arctic are considered to be and to remain of great advantage to Canada, and the Canadian Government decided to make *ex gratia* a pecuniary grant to Commander Sverdrup, which would at the same time be a consideration for the delivery of all original maps, records, diaries, and other material in the explorer's possession.

work for the season has been chiefly in New Brunswick.

The possibilities of mineral development in the Northwest have created a great interest in the water-power resources of that district. Accordingly, photographic surveys were made of the Lockhart, Taltson, and Hay rivers, and detailed studies of the power possibilities of these rivers are being made from the photographs.

In the development of new uses for aerial photography and aerial surveying, experimental work was undertaken this year. This was in connection with the application of aerial methods to hydrography and hydrographic surveying, and to the taking of the national inventory of our forest resources.

Aerial reconnaissance and transportation work which was initiated last year in connection with geodetic surveying has been carried on successfully throughout the season in northern Quebec. Other interesting operations of the year include photographs for the location of a railway line, the completion of the photographic survey of the English river, and other work carried out for the delimitation of flooded areas and flood control at Lesser Slave lake.



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